Vol. IV. Price, 7s. 6d. Part II.

# Bothalia

A RECORD OF

CONTRIBUTIONS

FROM THE

NATIONAL HERBARIUM

UNION OF SOUTH AFRICA

PRETORIA

EDITED BY

**E. P. PHILLIPS, M.A., D.Sc., F.R.S. (S.Afr.),**

CHIEF, DIVISION OF BOTANY AND PLANT PATHOLOGY, DEPARTMENT OF AGRICULTURE AND FORESTRY

PRETORIA; AND

DIRECTOR OF THE BOTANICAL SURVEY OF THE UNION OF SOUTH AFRICA

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# SOUTH AFRICAN XYLARIACEAE.

By Julian H. Miller.

There are very few African records of members of this family to be found in early mycological literature. The publication by Cooke and Kalchbrenner (7–8, 12–14) of the Wood collection from Natal and the MacOwan collection from Somerset East, 1879–1882, were among the first. Most of the recent descriptions have been by Lloyd (15–31) and Van der Byl (1–5).

This study was initiated at the request of Dr. E. M. Doidge, Principal Plant Pathologist in the Division of Botany and Plant Pathology in the Department of Agriculture and Forestry, Union of South Africa. The species included in the paper are based on collections that she sent the writer from the Mycological Herbarium at Pretoria and on the South African specimens in Kew Botanical Gardens Herbarium. In all cases references are cited to previous South African literature where such exists.

The writer wishes to express his appreciation to Dr. Doidge for very valuable aid in the study of specimens and the location of South African literature.*

## SYSTEMATIC ACCOUNT.

The family *Xylariaceae* includes all fungi whose ascomycete stage is borne in perithecia immersed in a stroma, with definite walls, opening by an ostiole, free paraphyses merging into short periphyses in the ostiole; with asci lining the wall, cylindrical, short or long stalked, with uniseriate spores; ascospores continuous, elliptical, varying from light to very dark brown with a narrow longitudinal germ pore.

Very small one-celled conidia are borne on short sterigmata of upright branched conidiophores, densely covering the surface of the initial stroma.

The majority of the species are found on woody parts of plants, and only a comparatively small number occur on dung of various animals.

This is a very large family of many variations, and the environmental variants are more noticeable than the genetic. Also, there are few gaps that cannot be bridged by many intermediates. For example, in most species of *Hypoxylon* the perithecia may be free of stroma as in *Rosellinia* or completely immersed in a flat stroma with no visible projections, and may vary in colour from bright red to brown or black, all depending on humidity during growth stage and characters of the substrate. The recognition of species then can be accomplished only by coupling many field studies with descriptions in the literature.

Most of the species are widely distributed over the world, but many follow thermal zones. *Hypoxylon multiforme* and *H. fuscum* are apparently confined to the northern hemisphere, and the bright red series, *H. hypomiltum* and *H. haematostroma*, to the tropics, while *H. rubiginosum* is found on every continent and in every country.

## KEY TO THE GENERA.

### Xylariaceae.†

A.—Perithecia single in a superficial stroma..... 1. *Rosellinia.*

B.—Perithecia several to many in the stroma.

(*a*) Perithecia seated in base of stroma, with more or less elongated necks, monostichous or polystichous; disc cupulate or effuso-convex, carbonous to woody-leathery..... 2. *Nummularia.*

(*b*) Perithecia always monostichous, seated in periphery of stroma.

1. Stroma semi-globose to pulvinate, applanate to convex, discrete or effused, not definitely stalked.

x. Stroma dark inside.

o. Interior concentrically zoned..... 3. *Daldinia.*

oo. Interior not zoned, concolorous. Perithecia globoid to angular-elongate..... 4. *Hypoxylon.*

xx. Stroma bright coloured to white inside as in Xylaria..... 5. *Penzigia.*

2. Stroma broadly clavate to filiform or capitate, simple or branched, definitely stalked.

x. Fertile stroma capitate, forming an expanded disc in which the perithecia are uniformly distributed.

o. Caespitose, forming a crust on wood..... 6. *Kretzschmaria.*

oo. Not caespitose, on dung..... 7. *Poronia.*

xx. Fertile region clavate or filiform..... 8. *Xylaria.*

* Deur die goedgunstigheid van die trustees van die Van der Byl Herbarium en van die Stellenbosse Universiteitsraad is 'n geleentheid aan Dr. Doidge vir die bestudering van hierdie groep swamme aangebied, wat in die versamelings van wyle Dr. van der Byl te vinde is. Verwysing na hierdie monsters sal in verband met die verskillende soorte gevind word.

† The above list of genera includes only those involved in this study.

## **DALDINIA** Ces. & De Not.

Schema Sferiac. in Comm. Critt. Ital. 1 ; 197. 1863.

1. **Daldinia concentrica** (Bolt. ex Fr.) Ces. & De Not.
Comm. Critt. Ital. 1 : 198. 1863.

*Sphaeria concentrica* Bolt., Fung. Halif. append. p. 180, tab. 180. 1791.
*Valsa tuberosa* Scop., Flor. Carniol. 2nd ed. p. 399. 1772.
*Sphaeria tunicata* Tode, Fung. Meckl. Sel. II p. 59, tab. 17, f. 130. 1791.
*Sphaeria fraxinea* With., Arrang. Brit. Pl. 3rd ed. t. 4, p. 393. 1796.
*Sphaeria concentrica* Fr., Syst. Myc. II p. 331. 1823.
*Hypoxylon concentricum* Grev., Scot. Crypt. Flora, VI, tab. 324. 1828.
*Hypoxylon concentricum* Fr., Summ. Veg. Scand. p. 384. 1849.

Stroma hemispherical to globose, sessile with wide base to contracted below and plainly stipitate, 2–6 cm. in diameter and 1–3 cm. thick, solitary or coalescing ; young stroma rubiginous, erumpent from bark or superficial on decorticated wood, growing into one or more vertical stromata ; entostroma conspicuously zonate, fibrous-woody, dark brown with zones broad, 1–2 mm. wide, 10–16 in stroma ; ectostroma dark reddish purple, thin ; perithecia monostichous, ostiole umbilicate or slightly papillate in old specimens ; asci cylindric, 70–115 × 8–12 $\mu$ (p. sp.) with long stalk ; paraphysate ; ascospores 12–17 × 6–9 $\mu$ ; conidia ovate with greenish tint, continuous, 6–8 × 4–5 $\mu$.

The writer (33) has described the English specimens and Hopkins (11), Lloyd (15, 16, 18, 22, 26) and van der Byl (3, 5) have noted this fungus from South Africa. Kalchbrenner (12) cited it under *Hypoxylon concentricum*.

*Material Examined.*

On *Acacia decurrens*, Cramond, Natal, *Pole Evans*, 1335.

*Celastrus peduncularis*, Deepwalls, Knysna, *J. Phillips*, 18042.
*Olea foveolata*, Gxoqxowe Forest, Transkei, *District Forest Officer*, 9136.

On dead wood or branches of trees undet., Boschberg, Somerset East, *MacOwan* 1081, 22048 and Herb. Kew ; Northern Transvaal, *Doidge*, 1712 ; and *Wager*, 23231 ; near Mont-aux-Sources, *Doidge*, 23396 ; Fish Hoek, Cape, *Stephens*, 24836 ; Xumeni Forest, near Donnybrook, Natal, *Morgan* and *Doidge*, 30265.

2. **Daldinia Eschscholzii** (Ehr. ex Fr.) Rehm.

Ann. Myc. 2 ; 175. 1904.

*Sphaeria Eschscholzii* Ehr., Fung. Cham. 59, pl. 18, f. 8. 1820.
*Sphaeria concentrica* Fr. b. *Eschscholzii* Ehr. ex Fr., Syst. Myc. 2 : 331. 1823.
*Daldinia vernicosa* f. *microspora* Starb., Kongl. Svensk. vet. Acad. Handl. III. 279 : 6. 1901.

Stroma hemispherical to semiglobose, sessile to substipitate, solitary or coalescing, smooth or wrinkled when collected immature, 1·5–5 cm. diameter and 1–4 cm. thick ; entostroma conspicuously zonate, soft but persistent, with zones less than 1 mm. wide, and 15–26 in stroma ; ectostroma thin, carbonous, reddish-brown to black with age, smooth from inconspicuous, umbilicate ostiola ; perithecia monostichous, oblong-angular from compression ; asci cylindrical ; ascospores uniseriate, inequilaterally ellipsoid, light brown to very dark, 8–14 × 3–6 $\mu$.

On deciduous wood, common in tropics or subtropics.

The best specimen in the Pretoria Herbarium is No. 11013. This one has spores 8–10 × 3–4 $\mu$, and very close rings. The wrinkled surface is due to drying out before maturity has been reached and is not a specific character.

*Material Examined.*

On *Celtis rhamnifolia*, Lusikisiki, Cape, *District Forest Officer*, 6927.

*Croton* sp. Komatipoort, *Pole Evans*, 11013.
*Heteromorpha trifoliata*, Potchefstroom, *J. Phillips*, 30717.

On rotten wood, Knysna, *van der Byl 1336*.

## HYPOXYLON Bull.

ex Fr. Summa Veg. Scand. p. 383. 1849.

KEY TO THE SPECIES.

A.—Ostiola in centre of truncate discs.
1. Disc minute, less than 100 $\mu$ in diameter.
(*a*) Ascospores 5–7 × 2·5–3 $\mu$ ..... 1. *H. Stygium.*
2. Disc more than 100 $\mu$ in diameter.
(*a*) Ascospores 9 × 3 $\mu$ ..... 2. *H. truncatum.*
(*b*) Ascospores 17–22 × 4–6 $\mu$ ..... 3. *H. Gilletianum.*
B.—Ostiolar disc not present.
1. Stroma rarely showing perithecial projections, black, carbonous, applanate to convex.
(*a*) Surface coarsely papillate from projecting ostiola.
Ascospores 15–23 × 6–8 $\mu$ ..... 4. *H. mediterraneum.*
(*b*) Surface finely papillate to almost smooth.
Ascospores 11–16 × 5–8 $\mu$ ..... 5. *H. exutans.*
2. Stroma indefinite in form, perithecial projections usually evident.
(*a*) Ostiola papillate, ectostroma dark at maturity.
x. Initial stroma dirty-white, at maturity thick, easily separating from substrate.
Perithecia large, ascospores 28–34 × 7–10 $\mu$ ..... 6. *H. deustum.*
xx. Initial stroma bright red.
Perithecia small, ascospores 8–11 × 4–5 $\mu$ ..... 7. *H. glomeratum.*
C.—Ostiola umbilicate, not projecting beyond ectostroma.
1. Stroma 4–10 mm. thick, hemispheric to applanate, with trace of 1 or 2 zones, some shade of red to dark purple-brown.
Ascospores 12–17 × 6–7 $\mu$ ..... 8. *H. sclerophaeum.*
2. Stroma not thick as above, some shade of red.
(*a*) Blood-red particles conspicuous in ectostroma between perithecia.
x. Ascospores 8–11 × 5–6·5 $\mu$ ..... 9. *H. hypomiltum.*
xx. Ascospores 14–18 × 7–9 $\mu$ ..... 10. *H. haematostoma.*
(*b*) Ectostroma not as above.
Ascospores 9–12 × 4–5 $\mu$ ..... 11. *H. rubiginosum.*

### 1. **Hypoxylon Stygium** (Lév.) Sacc.

Syll. Fung. 1 : 379. 1882.

*Sphaeria Stygia* Lév., Ann. Sci. Mat. 5 : 258. 1846.
*Hypoxylon puiggarii* Speg., Bol. Acad. Cient. Cordoba 11, no. 257. 1889.
*H. annuliforme* Rehm., Verh. bot. Ver. Brand. p. 65. 1890.
*H. platystomum* Ell. & Ev., N. Am. Pyren. p. 649. 1892.
*H. microcarpum* Penz. & Sacc., Malpighia 11 : 492. 1897.
*H. bogoriense* v. Höhn., Sitzb. K. Akad. d. Wiss. Wien, 118, abt. I, p. 341. 1909.
*H. punctatum* Petch, Ann. Roy. Bot. Gard. Peridenіya 8 : 153. 1924.

Stroma pulvinate or effused, originating as a very thin reddish-brown layer under moist conditions, or a reddish slate colour if exposed, gradually darkening until at maturity it is shining black, hard and carbonous, smooth with perithecia immersed or almost free. Perithecia very small, the vertices growing through the ectostroma to form a ring in the centre of which is the small, conical ostiolum ; asci cylindrical, paraphysate, 46–55 × 4–5 $\mu$, short-stalked ; ascospores uniseriate, oblong to navicular, at maturity dark brown, 5–7 × 2·5–3 $\mu$.

Common on deciduous wood throughout the tropics and subtropics.

This species has the smallest perithecia and spores in the annulate group. The perithecia may be completely immersed as in *H. exutans*, or almost as free as in a *Rosellinia*. The smaller spores and initial red stroma instead of green, distinguish it from *H. truncatum*.

Not previously noted from South Africa. The writer (34, 38) has described it from South America.

*Material Examined.*

On wood, Town Bush Valley, Pietermaritzburg, *Rump 106*, 27760.

*African Specimens in Kew Herbarium.*

As *H. annulatum*, Uganda, *Small 63, Maitland 315* ; Kisubi Forest, Uganda, *Maitland 521.*

As *H. marginatum*, Congo, *Vanderyst 4170.*

As *H. microcarpum*, Uganda, *Maitland 126.*

As *H. annuliforme* Rehm. n. sp., in Museum botanicum Berolense, Africa.

2. **Hypoxylon truncatum** (Schw. ex Fr.) Mill.

Trans. Brit. Myc. Soc. 17 : 130. 1932.

*Sphaeria truncata* Schw., Syn. Car. no. 174. 1822.
*Sphaeria truncata* Fr., Syst. Myc. 2 : 442. 1823.
*Sphaeria annulata* Schw., Jour. Acad. Nat. Sci., Phila. 5 : 11. 1825.
*Sphaeria annulata* v. *depressa* Fr., Elench. Fung. 2 : 64. 1828.
*Sphaeria marginata* Schw., Trans. Amer. Phil. Soc. II, 4 : 190. 1832.
*Sphaeria truncatula* Schw., loc. cit. p. 210.
*Hypoxylon annulatum* Mont., C. Gay, Hist. Chile Bot. 7 : 445. 1850 (Excl. spec.).
*Hypoxylon marginatum* Berk., Outl. Brit. Fungol. p. 387. 1860.
*Rosellinia nitens* Ces., Note Bot. p. 13. 1872.
*Hypoxylon chalyboeum* Berk. & Br., Jour. Linn. Soc. 14 : 121. 1875.
*Hypoxylon glomiforme* Berk. & Curt., Grevillea 4 : 49. 1875.
*Hypoxylon Murraii* Berk. & Curt., Grevillea 4 : 49. 1875.

Stroma pulvinate or effused, at first green, later brown and at maturity shining black and carbonous, indefinite in shape, varying from hemispheric, 2–3 mm. in diameter and 1–2 mm. thick, to applanate and indefinitely effused, with immersed or almost free perithecia ; perithecia globose to oblong, projecting through ectostroma to form an annulate disc around each papillate ostiolum ; asci cylindrical, 75–110 × 6–7 $\mu$, with attenuated stalk, paraphysate ; ascospores uniseriate, oblong-navicular, light brown to dark, 7–9 × 3–3·5 $\mu$, chiefly 9 × 3 $\mu$.

On deciduous wood in tropics and semitropics.

Most mycologists have followed Ellis and Everhardt in placing the forms with projecting perithecia under *H. annulatum*, and those with sunken ones under *H. marginatum*. These, however, are environmental forms of the same species.

The writer (39) has added to the list of synonyms, Cheesman (6) and van der Byl (5) have described it from South Africa and Lloyd (18) determines the No. 31372 below as *H. fuscum*.

*Material Examined.*

On bark and on rotting wood, Knysna, *Bottomley*, 30745, *van der Byl 1340* and *2756* ; Forest Hall, Knysna, *Duthie 148*, 31372 (in van der Byl Herb. under *H. fuscum*) ; Xumeni Forest, nr. Donnybrook, *Doidge*, 32148 ; (as *Hypoxylon annulatum*) South Africa without locality, *van der Byl 2238*, *2247*, Herb. Kew.

3. **Hypoxylon Gilletianum** Sacc.

Ann. Myc. 4 : 76. 1906.

*Hypoxylon africanum* van der Byl, S. Afr. Jour. Sci. 25 : 185. 1928, and Ann. Univ. Stell. 10 : 6. 1932.

Stroma hemispheric, ·5–1 cm. in diameter and 1–3 mm. thick, isolated to confluent in masses, 2 cm. in diameter, black and shining hard carbonous ectostroma and woody black entostroma ; perithecia globose, ·5–·6 mm. in diameter, with papillate ostiola in centre of annulate depression ; asci cylindric, 85–120 × 4–6 $\mu$, with tapering stipe, paraphysate ; ascospores elongate, inequilaterally ellipsoid, brown, 17–22 × 4–6 $\mu$.

This species is very close to *H. malleolus* in spore shape and size, but differs in the smaller stroma. The American species is often nearly globose and 1–2 cm. in diameter, resembling a Daldinia.

The Saccardo type is from Kisantu, Congo, and apparently the species is confined to Africa. Lloyd (25) determined No. 31409 as *H. multiforme*.

*Material Examined.*

On bark or wood, Krantzkloof, Natal, *Doidge*, 9104 ; Umgeni Bush, Durban, *Rump 365c*, 30173 and *Rump 379b*, 30185 ; Forest Hall, Knysna, *Duthie 221*, 31409.

As *H. malleolus* var., Uganda, *Maitland 76 and 130*, Herb. Kew.

As *H. malleolus* forma, Tiko, Cameroon, *Dr. Dunlap 61*, Herb. Kew.

As *H. africanum* L., on dead stump, Durban, *van der Byl 598*.

4. **Hypoxylon mediterraneum** (De Not.) Mill.

Mycologia 33 : 75. 1941.

? *Sphaeria clypeus* Schw., Syn. Car. no. 42. 1822.
*Sphaeria mediterranea* De Not., Microm. Ital. dec. 6, p. 96. 1851.

*Hypoxylon regium* De Not., Sphaer, Ital cent. 1, fasc. 1, no. 12, p. 15. 1863.
*Hypoxylon repandoides* Fckl., Symp. Mycol. Jahrb. Nassau Ver. Natur. 23 : 236. 1869.
*Diatrype clypeus* Berk., Grev. 4 : 95. 1876. Non Schw.
*Nummularia repandoides* Sacc., Syll. Fung. 1 : 397. 1882.
*Nummularia australis* Cke., Grev. 11 : 148. 1883.
*Nummularia clypeus* Cke., Grev. 12 : 6. 1883. Non Schw.
*Nummularia mediterranea* Sacc., Syll. Fung. 1 : 400. 1882.
*Nummularia regia* Sacc., Syll. Fung. 1 : 400. 1882.

Stroma applanate to convex, 1–1·5 mm. thick, indefinitely effused; ectostroma very hard carbonous, black; entostroma black and woody, surface smooth except for coarsely papillate ostiola; perithecia in periphery, globose to oblong-angular from crowding; asci cylindrical, 97–116 × 9–12 μ, with short stalk and surrounded by rather broad paraphyses; ascospores elliptical, brown, 15–23 × 6–8 μ.

On wood, apparently more common in America than in either Europe or Africa.

This species is often confused with the European *Hypoxylon nummularium* Bull. ex Fr. (*Numm. Bulliardi* Tul.) but can easily be distinguished by the more coarsely papillate ostiola and larger spores. The ascospores of the latter are more broadly elliptic and 9–14 × 7–9 μ. Van der Byl (5) describes this under *H. clypeus*.

*Material Examined.*

On *Quercus* sp., Stellenbosch, *van der Byl 1303*, as *H. clypeus*. *Salix* sp., on dry wood, Lady Grey, *R. Nel* (*van der Byl 1727*) as *H. clypeus*; on stump, Dordrecht (*van der Byl* 2449) as *H. clypeus*.

On wood, South Nigeria, *Farquharson 36*, Herb. Kew, as *Nummularia* sp.

5. **Hypoxylon exutans** Cke.

Grevillea 8 : 66. 1879.

*Diatrype exutans* Cke., Ann. N.Y. Acad. Sci. 1 : 185. 1879.
*Anthostoma exutans* Sacc., Syll. Fung. 1 : 296. 1882.
*Nummularia exutans* Cke., Grev. 12 : 8. 1882.

Stroma applanate to convex, orbicular to indefinitely effused, black inside and outside, ectostroma hard, carbonous, surface smooth with indistinct ostiola to slightly papillate, thin, 1–1·5 mm. thick; perithecia closely packed in periphery, ·4–·6 mm. diam.; asci cylindrical, short stipitate, 95–120 × 8–11 μ, paraphyses broad; ascospores oblong-elliptic, brown to almost black, 11–16 × 5–8 μ.

Common on wood in tropics and subtropics.

This species differs from *H. mediterraneum* in possession of smaller spores and more finely papillate ostiola and from *H. nummularium* in larger, more elongate spores. This fungus thus lies just between these two species.

The writer (38) has described it from Venezuela, and Kalchbrenner (12) from South Africa.

*Material Examined.*

On *Acacia mollissima*, Town Bush Valley, Pietermaritzburg, *Rump 119*, 27765.

On wood, Bazuja, Kaffraria, *Baur 704*, Herb. Kew (as *Hypoxylon exutans*, cited by Kalchbrenner); Xumeni Forest, near Donnybrook, *Morgan* and *Doidge*, 27725; Knysna, *van der Byl 713 and 2233* (as *H. punctulatum* and *Nummularia punctulatum*).

6. **Hypoxylon deustum** (Hoffm. ex Fr.) Grev.

Scot. Crypt. Fl. 6 : tab. 324, fig. 2. 1828.

*Sphaeria maxima* Hall., Hist. Stirp. Helv. 3 : 122. 1768.
*Sphaeria deusta* Hoffm., Veg. Crypt. 1 : 3, tab. 1, fig. 2. 1787.
*Sphaeria versipellis* Tode, Fung. Meckl. Sel. fas. 2 : 55, tab. 17, fig. 129. 1791.
*Hypoxylon ustuatum* Bull., Champ. Fr. 1 : 176. t. 487, fig. 1. 1791.
*Sphaeria deusta* Hoffm. ex. Fr., Syst. Myc. 2 : 345. 1823.
*Hypoxylon ustulatum* Bull. ex. Fr., Summa Veg. Scand. p. 383. 1849.
*Ustulina vulgaris* Tul., Sel. Fung. Carp. 2 : 23, tab. 3, figs. 1–6. 1863.
*Ustulina deusta* Hoffm. ex. Petrak, Ann. Myc. 19 : 279. 1921.

Stroma indefinite, on rough substratum variously distorted, irregularly effused, following the inequalities of the bark, undulate repand to subpulvinate, 1·5–3 mm. thick; on smooth wood applanate, subzonate and much thinner; the young stroma greyish white, fleshy-

leathery, becoming carbonous and black with age, the mature stroma easily separating along the line of the perithecial bases ; perithecia very large with papillate ostiolar necks, far apart ; asci cylindrical and tapering, 190–260 × 10–15 μ, p. sp., stalk 50–60 μ in length ; ascospores elliptical to inequilateral, opaque at maturity, 28–34 × 7–10 μ ; paraphyses filiform branched ; conidia hyaline, smooth, narrowly ovate, 5–6·5 × 2–3 μ.

On wood, usually old stumps near ground line, common in every country.

The writer (33) and also van der Byl (5) retain this form in the genus Hypoxylon. This species approaches *Hypoxylon serpens*, but differs in larger spores and having the perithecia less closely packed in the stroma so that the ostiola are farther apart in the ectostroma.

*Material Examined.*

On wood, usually old logs and stumps, Kromrivier, Rustenburg Distr., *Doidge* and *Bottomley*, 32146 ; Eshowe, *van der Byl 494, 501, 691, 704* ; Stella Bush, Durban, *van der Byl 1065* ; Woodbush, N. Transvaal, *van der Byl 1486*.

7. **Hypoxylon glomeratum** Cke.

Grev. 11 : 134. 1883.

*H. mascariensis* Berk. ex Cke., Grev. 11 : 131. 1883. Non Mont.
*H. anthracoderma* Speg., Fung. Guar. Puig. 3 : 28. 1888.
*H. Berkeleyi* Sacc., Syll. Fung. 9 : 551. 1891.
*H. Bakeri* Earle, Torr. Bot. Club Bull. 26 : 633. 1899.
*H. vinosa-purpureum* Ell. & Ev., Fl. Lud. Nom. nud.
*H. cohaerens* Pers. ex Fr. var. *brasiliensis* Starb., Ascom. Reg. Exped. 2 : 8. 1901.
*H. rubigineo-areolatum* Rehm. var. *microspora* Theiss., Ann. Myc. 6 : 345. 1908.
*H. Merrillii* Syd., Ann. Myc. 15 : 212. 1917.
*H. cupricolor* Petch, Ann. Roy. Bot. Gard. Peradeniya 8 : 158. 1924.
*H. rubigineo-areolatum* Rehm var. *Bakeri* (Earle) Mill., Mycol. Explor. of Colombia. Jour. Dept. Agric. P.R. 14 : 273. 1930.

Stroma indefinitely effused, applanate to convex to pulvinate, when in small glomerules 1–2 mm. thick ; perithecia globose to angular, completely immersed or often completely separated, ectostroma at first bright red, varying to reddish brown with age, and finally at maturity dark purplish brown with small, black, papillate ostiola ; asci cylindrical, 50–68 μ p. sp., plus 40–60 μ long stripes ; paraphysate ; ascospores uniseriate, inequilaterally ellipsoid, brown, 8–11 × 4–5 μ.

Common the world over. The writer has seen specimens from Canada to the Argentine and from Africa and Asia, but not from Europe.

A reddish brown specimen can be distinguished from *H. rubiginosum* by the papillate ostiola, and later dark stages from *H. multiforme* by the much smaller perithecia, and from *H. serpens* by the spores of the latter being larger, 12–15 μ in length.

No. 27682 is exactly like Cooke's type, while in No. 29821 the perithecia are almost free as is the type of *H. Bakeri*. These are environmental differences.

*Material Examined.*

On wood, Town Bush Valley, Pietermaritzburg, *Rump*, 27682, and *Rump 105*, 27794 ; Xumeni Forest, near Donnybrook, *Morgan* and *Doidge*, 28935 and 29821.

8. **Hypoxylon sclerophaeum** Berk. & Curt.

Exot. Fung. Schw. Jour. Acad. Nat. Sci. Phila. 2nd ser. 2 : 285. 1853.

? *Sphaeria coelata* Fr., Linnaea 5 : 540. 1830.
? *H. suborbicularis* Welw. & Curr. Fung. Angol., Trans. Linn. Soc. 26 : 281. tab. 17. 1868.
*H. placentiforme* Berk. & Curt., Jour. Linn. Soc. 10 : 383. 1869.
*H. Wrightii* Berk. & Curt., l. c. 1869.
*H. coelatum* Ces., Fung. Born. Atta Acc. Sci. fisich e. matim. di Napoli 8 : 19. 1879.
*Nummularia suborbicularis* Sacc., Syll. Fung. 1 : 399. 1882.
*N. suborbicularis* Sacc. v. *Cookeanum* Sacc., l. c.
*N. Wrightii* Sacc., Syll. Fung. 1 : 398. 1882.
*N. placentiformis* Sacc., Syll. Fung. 1 : 399. 1882.
*N. nicaraguerense* Ell. & Ev., Ia. Univ. Bull. 2 : 394–415. 1893.
*Penzigia polyporus* Starb. Aacom. der Schwed. Chaco.-Cordill. Exp. p. 32. Ark. für Bot. 5. 1905.

*Daldinia placentiformis* (B. & C.) Theiss., Ann. Myc. 7 : 4. 1909.
*N. Cookeana* (Sacc.) Rehm., Asom. Phil. Leafl, Bot. 6 : 2273. 1914.
*Pyrenopolyporus Hunteri* Lloyd, Myc. Writ. 5 : 706. f. 1054. 1919.
*H. amorphum* Ell. & Ev. Nom. nud. Kew Herb.
*Hypodiscus-placentiformis* (B. & C.) Rick., Broteria ser. Bot. 25 : 34. 1931.

Stroma hemispheric, suborbicular, 2–3 × 1·5–2 cm. and 1–1·5 cm. thick, or indefinitely effused, often 15–20 cm. in length and 1 cm. thick; ectostroma smooth reddish-purple, varying to dark brown in age, entostroma shiny black to brown with one or two very faint zones; perithecia semiglobose to elongate-compressed in periphery of stroma, ostiola indistinct to umbilicate; asci cylindrical, 60–75 $\mu$ long p. sp. plus stipe 50–60 $\mu$ in length; paraphysate; ascospores elliptic-oblong, brown, 12–17 × 6–7 $\mu$.

Cosmopolitan in tropics and subtropics.

This species is intermediate between Daldinia and Hypoxylon. The texture of the stroma and occasional faint zones remind one of the former, but the shape, usually almost flat, is definitely that of the Hypoxylon concept.

The writer (38) describes this species and gives a list of synonyms. The variety *Cookeana* is this form, but the species is probably something else. The type of the latter *Welwitsch no. 137*, in woods between Monimo and Ivaiitala, Huilla, has been lost from Kew.

*Material Examined.*

As *H. suborbiculare* var. *Cookeanum* Sacc., South Nigeria, *Farquharson 61*. Herb. Kew. *Pyrenopolyporus Hunteri* Lloyd, Ashanti, Coomassee, *T. Hunter*, Kew.

9. **Hypoxylon hypomiltum** Mont.

Ann. Sci. Nat. 2nd ser. 13 : 356. 1840.

*H. subgilvum* Berk. & Br., Ceylon Fungi, Jour. Linn. Soc. 14 : 120. 1875.
*H. Fendleri* Berk. ex Cke., Grev. 11 : 132. 1883.

Stroma convex-applanate, semiorbicular, with completely immersed perithecia, or pulvinate with almost free ones, 1–2 mm. thick or indefinitely effused and much thinner; ectostroma bright red with deep blood-red particles, with smooth surface with umbilicate ostiola, with entostroma below the red layer, dark brown; asci cylindrical, 55–70 $\mu$ p. sp., with stipe 50–60 $\mu$ long; paraphysate; ascospores elliptic-navicular, 8–11 × 5–6·5 $\mu$.

Common in the tropics over the world.

This species and *H. haematostroma* when developed under the optimum conditions are brilliant red, but vary from this colour to brown or even black with lack of humidity or with age. The blood-red particles are, however, always noticeable in the ectostroma and will separate them from *H. rubiginosum*. These forms have no definite shape except as determined by the substrate. The writer (37) has previously described the differences between members of the red series.

Cooke (8) named No. 10390, *H. rubiginosum*.

*Material Examined.*

On wood, Inanda, Natal, *Medley Wood 523*, 10390 and Herb. Kew; Winter's Kloof, Natal, *Rump*, 27532; Caverns, near Mont-aux-Sources, *Bottomley*, 28893; Xumeni Forest, near Donnybrook. *Morgan and Doidge*, 29820; Knysna, Cape, *Bottomley*, 30746.

10. **Hypoxylon haematostroma** Mont.

Sagra, R. de La, Fl. Cuba, p. 344, 1838–1842.

*H. vividum* B. & Br., Fung. of Ceylon, Jour. Linn. Soc. 14 : 122. 1875.
*H. vera-crucis* B. & Cke., Grev. 11 : 129. 1883.
*H. haematites* Lev. ex Cke., Grevillea 11 : 133. 1883.
*H. ochraceum* P. Henn., Hedwigia 36 : 228. 1897.
*H. subrutilum* Starb., Ascom. d. I. Rehn. Exped. II. p. 10, fig. 7–8. Bihang. t. K. Svenska Vet. Acad. Handl. bd. 27, afd. III. 1901.
*H. St. Janianum* Ferd. & Wge., Bot. Tids. 29 : 14. 1908.;

Stroma semiorbicular, or indefinitely effused, or in pulvinate glomerules, 1–2 mm. thick, with ectostroma red with blood-red particles, with lower entostroma black to dark brown; perithecia semiglobose to elongate-compressed in a palisade layer with umbilicate ostiola often inconspicuous; asci cylindrical, 60–75 $\mu$ p. sp., and with stipe 40–50 $\mu$ in length; paraphysate; ascospores 14–18 × 7–9 $\mu$, brown, inequilaterally elliptic.

Common in tropics over the world.

This has the appearance of a large spored form of *H. hypomiltum*. The two specimens listed below are very meagre and old, but have the internal characters of this species.

*Material Examined.*

On wood, Knysna, Cape, *Bottomley*, 30748, 31058.

11. **Hypoxylon rubiginosum** Pers. ex. Fr.

Summa Veg. Scand, p. 384. 1849.

*Sphaeria rubiginosa* Pers., Syn. Meth. F., p. 11. 1801.
*Sph. granulosa* Pers., Syn. Meth. F., p. 11. 1801.
*Sph. perforata* Schw., Syn. Car. n. 45. 1822.
*Sph. durissima* Schw., Syn. Car. n. 46. 1822.
*Sph. durissima* Schw. ex. Fr., Syst. Myc. 2 : 335. 1823.
*Sph. rubiginosa* Pers. ex Fr., Syst. Myc. 2 : 340. 1823.
*Sph. fuscopurpurea* Schw., Jour. Acad. Nat. Sci. Phila. 5 : 16. 1825.
*Sph. decorticata* Schw., Trans. Amer. Phil. Soc. Phila. n. ser. 4 : 191. 1832.
*Sph. investiens* Schw., l.c., p. 193. 1832.
*Sph. xanthostroma* Schw., l.c., p. 193. 1832.
*Sph. Catalpae* Schw., l.c., p. 193. 1832.
*Hyp. perforatum* Schw. ex Fr., Summ. Veg. Scand. p. 384. 1849.
*H. luridum* Nits., Pyr. Germ. p. 31. 1867.
*H. botrys* Nits., Pyr. Germ. p. 34. 1867.
*H. Laschii* Nits., Pyr. Germ. p. 36. 1867.
*H. purpureum* Nits., Pyr. Germ. p. 37. 1867.
*H. fragile* Nits., Pyr. Germ., p. 39. 1867.
*H. decorticatum* (Schw.) Curt., Geol. & Nat. Hist. Survey, N.C., pt. III, p. 140, 1867.
*H. investiens* (Schw.) Curt., l.c., p. 140. 1867.
*H. fuscopurpurem* (Schw.) Curt., l.c., p. 140. 1867.
*H. ferrugineum* Otth., Mittl. nat. Ges. Bern. p. 41. 1868.
*Diatrype cercidicola* B. & C. ex Pk., 25th Rep. N.Y. State Mus., p. 101. 1873.
*H. anthochroum* B. & Br., Jour. Linn. Soc. 14 : 122. 1875.
*H. trugodes* B. & Br., l.c., p. 123. 1875.
*H. mercidum* B. & Br., l.c., p. 123. 1875.
*H. florideum* B. & C., Grev. 4 : 50. 1875.
*H. concurrens* B. & C., Grevillea 4 : 93. 1876.
*H. suborbiculare* Pk., 30th Rep. N.Y. State Mus., p. 63. 1878.
*Anthostoma cercidicolum* (B. & C. ex Pk.) Sacc., Syll. Fung. 1 : 306. 1882.
*H. durissimum* (Schw.) Sacc., Syll. Fung. 1 : 378. 1882.
H. *Catalpae* (Schw.) Sacc., Syll. Fung. 1 : 392. 1882.
*H. ianthinum* Cke., Grev. 11 : 132. 1883.
*H. piceum* Ell., Amer. Nat. 17 : 193. 1883.
*H. guarapiense* Speg., Fung. Guar. Puig. 1 : 81. 1886.
*H. onnii* Karst., Symb. et Myc. Fenn. p. 143. Hedwigia. 1887.
*H. subchlorinum* Ell. & Calk., Jour. Myc. 4 : 86. 1888.
*H. subluteum* Ell. & Ev., N. Amer. Pyr. p. 648. 1892.
*Nummularia lateritia* Ell. & Ev., Proc. Acad. Nat. Sci. Phila., pt. 1, p. 144. 1893.
*H. Pilgerianum* P. Henn., Hedwigia, p. 136. 1900.
*H. subrubiginosum* P. Henn. nom. nud. C. F. Baker n. 335.
*H. lianincolum* Rehm., Ascom. Phil. IV, Leafl. Phil. Bot. 6 : 1944. 1913.

Stroma pulvinate to effused, indefinite in extent, continuous for several centimetres on decorticated wood, or 1–3 mm. thick when erumpent from bark ; young stroma fleshy-leathery, at maturity woody, very old specimens crumbling, never carbonous ; colour of stroma varying, when young bright brick-red to purplish red to shades of reddish brown, becoming black with extreme age ; perithecia variable in size, depending on distance apart in stroma ; ostiolar necks umbilicate, often containing a white mycelial growth in ostiolum ; asci cylindrical, tapering to a long stalk, 70–80 × 7 $\mu$ p. sp., and 65–80 $\mu$ for the stalk ; ascospores at maturity dark brown, inequilaterally eliptical, 9–12 × 5–5 $\mu$ ; conida minute, elliptical, 4–5 × 3 $\mu$.

No. 28569 is a flat, dark reddish-purple type that one often sees on decorticated wood. This is the most common species anywhere in the world, and therefore has been given more

names than any other species. No. 31069 is parasitised by *Tympanopsis euophala* (B. & C.) Starb., and the writer has collected that combination in Georgia and even in England. The parasite does not attack other species, and so its presence is one point in the diagnosis,

*Material Examined.*

On *Mimusops Zeyheri*, Boschfontein, near Wolhuter's Kop, *Doidge and Bottomley*, 31068 and 31069 (the latter No. parasitised by *Tympanopsis euomphala*).

On wood, Town Bush Valley, Pietermaritzburg, *Rump 188*, 28569; Randfontein Estates, Johannesburg, *Lurie*, 28746.

*Excluded Names.*

There are several Hypoxylon names found in the literature of this region that are not included in the systematic account. These are given below with reasons for their exclusion.

1. **Hypoxylon argillaceum** Fr. (non Pers.) MacOwan collection from Somerset East, determined by Kalchbrenner (12). No specimen was found in Kew Herb.
2. **H. colliculosum** Nits., described by Cheesman (6). No specimen was available for study. Also the name is not valid. It is a synonym of *H. serpens*.
3. **H. cornutum** Hoffm., based on Drêge No. 9461. No specimen available. Also name not valid. It is a synonym of *X. Hypoxylon*.
4. **H. fuscum** Pers. ex Fr. in Thüm; Fung. Austro-afric., No. 52 and van der Byl (5). Specimens not available. The Lloyd (18) citation was based on a *H. truncatum* specimen.
5. **H. malleolus** B. & R., Hopkins (10, 11). No specimens were seen, but this is probably *H. Gilletianum*.
6. **H. natalense** ? Lloyd (29). No specimen available for study.
7. **H. punctilatum** B. & R., van der Byl (5). Specimen studied is *H. exutans*.

## KRETZSCHMARIA Fries.

Summa Veg. Scand., p. 509. 1849.

1. **Kretzchmaria cetrarioides** (Curr. & Welw.) Sacc.

Syll. Fung. 2 : XXIX. 1883.

*Hypoxylon cetrarioides* Curr. & Welw., Angol. Fung. p. 282, tab. 18, figs. 5–6. Trans. Linn. Soc. 26 : 282. 1869.
*Sphaeria lichenoides* Berk., Kew Herb. Nom. nud.
*Rhopalopsis lichenoides* (B.) Cke., Grev. 11 : 94. 1883.
*Rhopalopsis cetrarioides* (C. & W.) Cke., Grev. 11 : 127. 1883.
*Kretzschmaria lichenoides* (B.) Sacc., Syll. Fung. 2 : Add. ad vol. I, XXIX. 1883.
*Kretzschmaria lichenoides* Rick., Ann. Myc. 7 : 8. 1909.

The stroma consists of a horizontal network of branches with vertical stalks bearing capitate fertile regions as in *Kretz. micropus*. The entire system at maturity becomes a more or less compact crust of free perithecial capitula above a fused mass of coalesced branches. This is indefinitely effused on wood and about 5–10 mm. high. The capitula are 3–6 mm. in diameter, semiglobose with convex surface and constricted under the head, each containing from 10–35 perithecia, with prominent papillate ostiola. The ascospores are 28–32 × 9–11 μ, acutely elliptical and dark brown.

There is a great deal of variation in the shape of the capitula. When closely compacted they are very flat on top and when separated they are more convex.

There is a specimen in Kew Herb. labelled *Sphaeria lichenoides* Berk., Port Natal, which is this species. It has never been formally described. The specimen cited below is old and not typical, and so is placed here with some hesitation.

*Material Examined.*

As *Sphaeria lichenoides* Berk., Port Natal. Kew Herb.

On wood, Xumeni Forest, near Donnybrook, *Morgan and Doidge*, 27726.

2. **Kretzschmaria knysnana** van der Byl.

Ann. van die Univ. v. Stellenbosch 10 : 5. 1932.

Stromata separate, not united by a basal system, composed of closely packed, irregularly clavate, expanded fertile regions with peripheral perithecia, and attenuated stipes about 1 mm. thick and 5–6 mm. long, with clava 4–10 mm. in diameter. Surface of stroma

scabrous, brownish black, with very small papillate ostiola surrounded by a whitish ring. Perithecia irregularly arranged, 14–80 in each head. Fertile part of stroma solid, white inside, and slightly buff-tinted around perithecia. Ascospores inequilaterally elliptic, 26–33 × 7·9–9 μ.

The writer has not seen a specimen, and has taken the above description from that of van der Byl and notes and illustrations from Dr. Doidge. It very doubtfully belongs in Kretzschmaria and appears in no respects different from closely aggregated forms of *Xylaria anisopleura* or other tropical Xylarias.

*Material Examined.*

On rotton wood, "Tuin van Eden", Knysna, *van der Byl 2549.*

3. **Kretzschmaria micropus** (Fr.) Sacc.

Syll. Fung. 2 : Add. XXIX. 1883.

*Sphaeria micropus* Fr., Linnaea 5 : 542. 1830.
*Hypoxylon micropus* (Fr.) Sacc., Syll. Fung. 1 : 389. 1882.

Initial stroma consists of a horizontal branching system with upright stalks also bearing short branches, which finally enlarge at the apices into perithecial capitula. The entire mass at maturity develops into a widespread crust of fused branches and closely compact perithecial heads at approximately the same level. The individual branches are about 1–1·5 mm. thick, and are at first tomentose, later becoming glabrous. These give rise to secondary branches, and the whole mass is then about 5–10 mm. in height. The perithecial capitula are subglobose to pyriform, 2·5–3·5 mm. in diameter, at first brown, later black, with surface cracking and scaly, each with 1–5 perithecia with strongly papillate ostiola. The ascospores are inequilaterally elliptical with acute to obtuse ends, 31–35 × 10–12 μ.

Saccardo at first listed it as *Hyp. micropus* (Fr.), but later (Vol. 2 : XXIX) has it *Kretz. micropus* (Berk.). The Berkeley citation was a mistake which he acknowledged in Vol. 15.

Petch (41) says this species would appear to be doubtfully distinct from *Kretz. cetrarioides*. The writer feels that while they are similar in possessing the basal horizontal stroma and similar spores they differ in that in *Kretz. cetrarioides* the capitula are larger with an indefinite number of perithecia, and this character seems sufficient to maintain separate species.

Van der Byl (5) describes this species from South Africa.

*Material Examined.*

On wood, Knysna, *van der Byl 2249*; Eshowe, Zululand, *van der Byl 500.*

## NUMMULARIA Tul.

Sel. Fung. Carp. 2 : 42. 1863.

1. **Nummularia Kalchbrenneri** (Sacc.) Comb. nov.

*Hypoxylon placenta* Kalch., Grev. 9 : 28. 1880. (Non Link & Fr.)
*H. Kalchbrenneri* Sacc., Syll. Fung. 1 : 364. 1882.
*N. placenta* Cke., Grev. 12 : 8. 1883.
*N. lepida* Syd., Ann. Myc. 22 : 425. 1924.
*H. lepidum* van der Byl, Ann. Univ. Stell. 10 : 7. 1932.

Stroma orbicular, carbonous, 3–4 mm. in diameter, with slightly sunken disc with raised border, with very indistinct ostiola. Perithecia seated in the base of the stroma, flask-shaped with fairly elongate neck. Ascospores dark brown, elliptic-navicular, 9–12 × 4–5 μ.

This is the same type of fungus as the common *N. discreta* on apple in Europe and America. *N. Baileyi* Cke. is a similar form but differs in the larger spores, 14–19 × 9–11·2 μ.

*Material Examined.*

On wood, Somerset East, *MacOwan 1304*, 20818. The writer has also seen the type in Kew Herbarium.

On rotten trunk of *Gonioma Kamassi*, Knysna, *van der Byl 1341* (Cotype of *N. lepida* Syd.).

Other Nummularia names in South African literature are found in this paper under Hypoxylon.

## PENZIGIA Sacc.

Myc. Malc. p. 20. 1888.

Emend. Petch, Ann. Roy. Bot. Gard. Perad. 8 : 138–141. 1924.

1. **Penzigia discolor** (B. & Br.) comb. nov.

*Hypoxylon discolor* B. & Br., Ceylon Fungi. Jour. Linn. Soc. 14 : 123. 1875.
*H. citrinum* Shear, Survey of P. R., N.Y. Acad. Sci. 8 : 66. 1926.

Stroma pulvinate, convex to irregular by mutual pressure, 1–3 mm. in diameter, ·5–1 mm. high, attached to the substrate at a central point. Surface dirty-white, scabrous, later grey and finally black and smooth. Context surrounding perithecia yellow-grumose, lower white and firm ; asci cylindrical, p. sp. 65–90 $\mu$ with stipe 40–50 $\mu$ long ; ascospores broadly elliptic, brown, 9–12 × 6–9 $\mu$.

A similar form that is yellow is *Hypoxylon quisquilliarum* Mont., but that has much larger spores, – 28–35 × 14–17 $\mu$. *Penzigia eterio* (B. & Br.) Petch has the same shape as *P. discolor*, but differs in being pinkish-white inside. The specimen cited below is fully equal to the Kew type.

*Material Examined.*

On dead wood, Xumeni Forest, near Donnybrook, Natal, *Morgan and Doidge*, 31062 : Umtali, *Eyles 4246* (*van der Byl 2413*), as *Hypoxylon* sp.

2. **Penzigia verrucosa** sp. nov.

Stroma convexo-rotundatum, ectostroma levi vel undulatum vel mutua pressione deformum, solum vel caespitosum, basi plana vel concava et plicata, centraliter affixa brevi stipite in substrato, 2–10 mm. in diam. et 1·5–5 mm. altum. brunneum vel nigrum, minute granuloso, verrucosum ; entostroma album, suberoso, lingnosum ; peritheciis monostichis, globosis vel angularibus, ·3–·6 mm. in diam., ostiolis emergentibus late papillatis ; ascis cylindraceis, paraphysatis, 8-spores, ascosporis oblongo navicularibus, diluto brunneis vel nigris, 30–37 × 10–12 $\mu$.

Ad ligna.

This species is near *Hypoxylon verrucosum* Theiss. and *Penzigia sessilis* Theiss. The former is semiglobose instead of flat hemispheric, and is probably the hypoxyloid form of *Xylaria anisopleura* Mont. It differs from *P. sessilis* in the prominent ostiola and verrucose surface. The spores of all three are about the same.

*Material Examined.*

On fallen log, Woodbush, Northern Transvaal, *Doidge*, 17793, Type.

## PORONIA Willd. ex Fr.

Summa Veg. Scand. p. 382. 1849.

1. **Poronia Oedipus** Mont.

Syll. Crypt. p. 209. 1856.
*Sphaeria* (*Poronia*) *punctata* var. *oedipoda* Mont., Ann. Sci. Nat. 2nd ser. 13 : 333. 1840.
*Sphaeria incrassata* Jungh., Flor. Javae Crypt. p. 87. 1838.
*Hypoxylon oedipus* Mont., Cuban Fl. p. 346, tab. 13, f. 2. 1838–42.
*Poronia macropoda* v. *cladonioides* Ces., Comm. Critt. 1 : 70. 1861.

Stroma erect, usually simple, with light, greying-brown stalk, 2–4 cm. high and 2–3 mm. thick at the swollen base, abruptly expanded at the apex into a concave then plane disc. The disc is orbicular, 2–3 mm. in diameter, light grey, with prominent black papillate ostiola. Perithecia globose to ovate, entirely sunken in the surface of the disc. Asci cylindrical, short-stipitate, 90–120 × 18–20 $\mu$ ; with uniseriate ascospores broadly elliptical, black, surrounded by a thick hyaline sheath, 28–30 × 14–16 $\mu$.

Found on animal dung. Kalchbrenner and Cooke (14) and van der Byl (5) cite this species from South Africa.

*Material Examined.*

On cow dung, Boschberg, near Somerset East, *MacOwan 1300*, Herb. Kew ; in Herb. S. African Museum, Cape Town, No. 33866, sub *P. macropus* Kalch.

2. **Poronia punctata** L. ex Fr.

Summa Veg. Scand. p. 382. 1849.

*Peziza punctata* L., Flor. Suec. Ed. II. p. 458. 1745.
*Sphaeria nivea* Haller, Stirp. Helvet. tom. III, p. 121. 1768.
*Poronia Gleditschii* Willd., Flor. Berol. Prodr. p. 400. 1787.
*Sph. Poronia* Pers., Syn. Meth. F. p. 15. 1801.
*Poronia fimetaria* Pers., Champ. Comest. p. 154. 1818.
*Sph. punctata* Fr., Syst. Myc. 2 : 330. 1823.

Stroma erect, at first clavate, later expanding apically into a flat to cupulate disc, 2–10 mm. in diameter and an attenuated, smooth light brown stipe, 1–2 cm. high; disc white to pale grey and dotted with prominent black ostiola with solid white context. Perithecia sunken in upper surface of disc, with broadly cylindric asci, 120–160 × 16–18 μ, with short stipes. Ascospores inequilaterally elliptic, dark brown to black, surrounded by a hyaline sheath, 18–26 × 10–14 μ.

This is the type of the genus. The distinctions between this species and the previous one lie chiefly in the spore dimensions and in the stipe characters. In *P. punctata* the stipe is gradually expanded upwards to the disc, while in *P. oedipus* it is enlarged near the base and decreases in diameter upward producing an abrupt contraction under the disc. Also, the stipe in *P. punctata* is immersed in the substrate, while that of *P. oedipus* is usually free from 1–2 cm. Both occur on cow or horse dung and are widely distributed, but *P. oedipus* is more common in the tropics. References are by Cooke (7) and Lloyd (19).

*Material Examined.*

On horse dung, Inanda, Natal *Medley Wood 404*, 11131 and Herb Kew; Mulder's Vlei Stellenbosch District, *Acocks*, 27663.
On dung, Hondjies Kuil, Barkly West, *Acocks*, 28632.

**ROSELLINIA** De Not.

Giorn. Bot. Ital. 2 : 334. 1847.

1. **Rosellinia aquila** (Fr.) De Not.

Sfer. Ital. p. 21, t. 18. 1863.

*Sphaeria byssedá* b. Tode, Meckl. Fungi 2 : 10. 1791.
*Sph. aquila* Fr., Syst. Myc. 2 : 442. 1823.

Perithecia superficial, gregarious to closely caespitose, globose, about 1 mm. in diameter, apex rounded, abruptly papillate, carbonous, dark brown to shining black with age, developing in a dense brown subiculum which sometimes persists; asci cylindric with long stipe, p. sp. 165–195 × 10–12 μ with stipe 27–35 μ in length; ascospores inequilaterally elliptic with acute ends, 25–30 × 7–9 μ, brown.

The specimen cited below is typical for the species except for the lack of any subiculum. However, the perithecia are fully mature and this surface mycelium often disappears with age.

*Material Examined.*

On old stems of *Rubus pinnatus*, Xumeni Forest, near Donnybrook, *Morgan and Doidge*, 31065.
On wood, Knysna, *van der Byl 2226*.

**XYLARIA** Hill. ex Fr.

Summa Veg. Scand. p. 381. 1849.

KEY TO THE SPECIES.

A.—Fertile clava covered with a pellicle, a layer distinct from the one encasing the perithecia.

1. Apices fertile, containing perithecia.

(*a*) Pellicle continuous, neither striate nor splitting in lines.

x. Surface white with black ostiola, clava semi-globose to conic ovate, 5–7 mm. in diameter, single or several on short branches coming from apex of long rooting stipe.
Spores 12–18 × 6–10 μ..... 1. *X. Doumetii*.

xx. Surface light brown, clubs up to 10 cm. high, clavate-cylindric, hollow at maturity, involute and splitting, perithecia completely immersed.
Spores 18-24 × 6–8 μ..... 2. *X. tabacina.*
xxx. Surface dark brown, glabrous, clubs clavate-cylindric, becoming hollow, perithecial projections evident with prominent papillate ostiola, 2–6 cm. high.
Spores 10 × 4 μ..... 3. *X. cubensis.*

(*b*) Pellicle splitting in lines.
x. Stroma cylindric to clavated becoming hollow.
o. Pellicle light yellowish brown, surface markedly reticulate.
Spores 18-23 × 6-7 μ..... 4. *X. reticulata.*
oo. Pellicle dark brown, surface chiefly marked with longitudinal lines.
Spores 9–11·5 × 4–6 μ..... 5. *X. variabilis.*

2. Apices sterile with acutely pointed tips.
(*a*) Pellicle splitting in wide anastomosing lines, perithecia in the depressions.
x. Surface dark umber-brown.
o. Stroma slender, much branched or simple.
Spores 11–16 × 5-7 μ..... 6. *X. arbuscula.*
Spores 9–12 × 4-5 μ..... 7. *X. multiplex.*

B.—No persistent pellicle, surface chiefly white to grey at first, later changing to black with maturity.

1. Apices sterile, pointed.
(*a*) Clava cylindrical with attenuated stipe.
x. Perithecial elevations very prominent.
o. Stipe stout, short, enlarged purple-pannose at base, clava 2–5 mm. in diameter, compressed or terete with short sterile apex.
Spores 8–10 × 4-5 μ..... 8. *X. bulbosa.*
oo. Stipe and clava slender. On fruits.
y. Clava 1·5–3 mm. in diameter, puboscent, simple with pointed sterile apex, or occasionally dichotomously branched above, stipe villous, perithecia large, ·5–1 mm. in diameter, very prominent at maturity.
Spores 8–11 × 4–4·5 μ..... 9. *X. ianthino-velutina.*
yy. Clava 1·5–2·5 mm. in diameter, glabrous, usually simple with very short sterile apex, perithecia fairly prominent, small ·3–·6 mm. in diameter.
Spores 10–12 × 4–5 μ..... 10. *X. Oxyacanthae.*
xx. Perithecial elevations not so prominent.
o. Clava compressed, 1·5–3 mm. wide, simple or much branched from base or above, apex short pointed, stipe villous. On wood.
Spores 10–14 × 4–5 μ..... 11. *X. Hypoxylon.*
oo. Clava semiglobose with an elongate filiform stipe.
y. Apices of fertile heads aristate or sharply pointed.
/ On wood or fruit rind.
Spores 14–16 × 4·5–6 μ..... 12. *X. heloidea.*
Spores 20–28 × 8 μ..... 13. *X. schreuderiana.*
// On leaves.
Spores 10–12 × 5–6 μ..... 14. *X. aristata.*
yy. Apices obtuse.
/ On dung, spores with hyaline sheath.
Spores 40–50 × 18–23 μ..... 15. *X. vaporaria.*

2. Apices fertile, obtuse.
(*a*) Clava cylindric, 2–4 mm. in diameter, terete, with elongate subterranean stipe and large semiglobose sterile sclerotia, surface brown varying to very dark with age, perithecia small, prominent, ostiola papillate; growing from termite nests.
Spores 4–5 × 2·5–3 μ..... 16. *X. nigripes.*
(*b*) Clava stout, rounded, with age black, rugose, stipe abbreviated, with varying shapes from hypoxyloid to oblong-clavate, single or branched from the base, white inside, solid not becoming hollow, usually with purple pannose base.
Spores 8–10 × 4 μ..... 17. *X. castorea.*
Spores 25–33 × 7–10 μ.
Fertile stroma roughened fragariform often hypoxyloid.. 18. *X. anisopleura.*
Fertile stroma rugose but not fragariform..... 19. *X. polymorpha.*

1. **Xylaria Doumetii** (Pat.) comb. nov.

*Poronia Doumetii* Pat., Rev. Myc. p. 136. 1893 and Rev. Myc. 17 : tab. 156, figs. 1–2. 1895.

Stroma cylindrical, consisting of a brown, roughened, subterranean stipe, 7–10 cm. long, and 2–4 mm. in diameter, terete, with upper 5–10 mm. above the ground, with single clava or with several short thick branches with fertile apical bulbose enlargements, 5–7 mm. in length and 3–5 mm. in diameter, with white surface, darkening somewhat with age, with white fleshy-leathery interior ; perithecia black in entire periphery of clava, with small, black, punctate ostiola ; asci cylindrical, p. sp. 103–110 × 10–11 $\mu$, with brief stipe 18–46 $\mu$ in length ; paraphysate ; ascospores elliptical, brown to black, 12–18 × 6–10 $\mu$.

On dead roots.

This diagnosis is based on specimens cited below and determined by Lloyd (29) or Miss. E. M. Wakefield. The transfer to Xylaria is necessary, because it does not occur on dung, the ascospores do not have the hyaline sheath, and finally the clava is not expanded into a disc as in Poronia.

*Material Examined.*

On soil, Armoedsvlakte, Vryburg, det. Lloyd, 15422 ; Hondjieskuil, Barkly West, *Acocks*, 28631.

On dead roots on ploughed ground, Kuruman, Cape, *Acocks* (Det. Wakefield), 28630.

2. **Xylaria tabacina** (Kickx.) Berk.

Hook. Jour. Bot. Kew Gard. Misc. 6 : 225. 1854.

*Hypoxylon tabacina* Kickx., Bull. Acad. Brux. 8 : 11. 1841.

Stroma simple, cylindrical to clavate with fertile clava, 3–10 cm. high and 4–8 mm. in diameter, terete, then splitting and becoming involute and hollow, with light brown smooth pellicle with very small inconspicuous dark ostiola ; with stipe 1–3 cm. in length, smooth, brown ; perithecia semiglobose, completely sunken in periphery of stroma ; asci cylindrical, p. sp. 100–120 × 8–11 $\mu$ with stipe 35–45 $\mu$ long ; paraphysate ; ascospores inequilaterally elliptic, brown, 18–24 × 6–8 $\mu$.

There is a good description of this Xylaria by van der Byl (2), also Lloyd (21) has cited it from South Africa. No specimens were seen by the writer.

*Material in van der Byl's Herbarium.*

On *Olea* sp., Knysna, *J. Phillips* (*van der Byl 2335*), *Podocarpus Thunbergii*, Knysna, *Duthie* (*van der Byl 1104*).

On dead wood, Knysna, *Keet* (*van der Byl 710*) ; "Tuin van Eden", Knysna, *van der Byl 2256*.

3. **Xylaria cubensis** Mont.

Syll. Crypt. p. 202. 1856.

*Hypoxylon cubensis* Mont., Cent. 2, n. 29. Ann. Sci. Nat. 2nd ser. 13 : 1840, and Fl. of Cuba, p. 347, t. 13, f. 1. 1842.

*Xylaria fusca* Lloyd, Myc. Writ. 5 : 770, f. 1155, 1156. 1918.

Stroma cylindric to clavate, apex rounded, usually terete but occasionally compressed, single or sometimes two, united at base, with fertile clava glabrous, fairly smooth, dark brown pellicle and perithecial projections evident with obtuse dark papillate ostiola, at first solid white inside but becoming hollow with extreme age, 1–4 × ·4–·8 cm. or wider when compressed ; with smooth brown stipe, 1–4 × ·2–·4 cm. ; perithecia in periphrey with cylindric asci, p. sp. 60–70 × 6–8 $\mu$ with stipe 45–55 $\mu$ long : ascospores inequilaterally elliptic, brown, 10 × 4 $\mu$.

On wood. Common in the tropics and semitropics of world.

This species is similar to *X. allantoidea* Berk., but differs in being dark brown rather than copper colour and in the smaller spores, 10 × 4 $\mu$ as against 10–14 × 4–6 $\mu$.

This has not previously been described from South Africa. Lloyd (21) described the Cuban type.

*Material Examined.*

On wood, Eshowe, Zululand, *Rump 385a*, 30238.

4. **Xylaria reticulata** Lloyd.

Myc. Writ. 7 : 1354, pl. 333, f. 3169, 3170. 1925.

Stroma stout, cylindric to clavate, terete, with obtuse fertile apex and brief stipe, clava with light yellowish-brown pellicle, splitting in lines, and checked in fine reticulations, glabrous, at first white and solid inside, later becoming hollow and involute ; perithecia immersed, ovate to semiglobose, with small papillate ostiola ; asci cylindric, paraphysate ; ascospores inequilaterally elliptic, brown, 18–23 × 7–7 $\mu$.

This species is very similar in size and shape to *X. cubensis*, but differs in spore dimensions and surface reticulations. Then from *X. tabacina* it is distinguished by the surface markings.

*Material Examined.*

On rotten wood, Knysna, *van der Byl 1350*, in Lloyd's Herbarium (Type), and part of specimen in van der Byl Herb. ; Knysna, *van der Byl*, 11887 in Lloyd Herb. under *X. rhopaloides*.

5. **Xylaria variabilis** Welw. & Curr.

Fungi angol., Trans. Linn. Soc. 26 : 280, t. 18, fig. 7. 1868.

Stroma cylindrical with obtuse fertile apex and very brief stipe, 3–4 cm. high and 2–4 mm. thick ; clava with thin dark brown crust, marked with longitudinal lines with protruding dark ostiola, white inside, becoming hollow ; stipe black, rugose, glabrous ; asci cylindrical, paraphysate ; ascospores navicular, brown, 9–11·5 × 4–6 $\mu$.

The writer has not seen the type, and the above description is drawn from the African specimens determined by Lloyd. The latter (29) and van der Byl (2) cite this species. Lloyd, fig. 909, illustrates *X. variabilis* and thinks it close to *X. gramica* Mont. However, the writer finds the Lloyd specimen to be brown rather than the light slate grey of *X. gramica*. Also it is much smaller and more fragile. The relationship of this specimen is entirely with the *X. Guyanensis*-*X. arbuscula* group and is very close to *X. cristata* Speg.

*Material Examined.*

On burnt stump, Durban, *van der Byl 771* ; Lloyd Herb. and Herb. van der Byl, Stellenbosch.

6. **Xylaria arbuscula** Sacc.

Michelia 1 : 249. 1878.

Stroma slender, single or often much branched or compressed with abruptly pointed sterile apices, and slightly expanded fertile region ; clava striate with fine raised bands, glabrous and even, but becoming black and torulose in old specimens, 2–15 × 1–2 mm., with stipe smooth or villous with long hairs, 4–40 mm. in length and 1·5 mm. in diameter ; perithecia globose with cylindric asci, p. sp. 75–95 × 6–7·5 $\mu$ with stalks 50–70 $\mu$ in length ; ascospores inequilaterally elliptic, brown, 11–16 × 5–7 $\mu$ ; paraphysate.

On wood. Common in tropics.

This species has been confused with *X. apiculata* Cke. in South African literature. Van der Byl (1) gives the spores of the latter as 11–15 × 4–6 $\mu$, but those of the type at Kew are much larger, 14–22·4 × 6–9 $\mu$. Nos. 11540, 23170 and 28484 show very well the dark brown striations of the club in Saccardo's Myc. Ven. 1192. These lines tend to disappear in old specimens and they become black roughened with projecting perithecial forms. The writer (38) has previously separated Xylariae of this type. Van der Byl (1) describes it under *X. apiculata*. Hopkins (11) also cites the latter name, but the writer has not seen his specimens.

*Material Examined.*

On wood and bark, Natal, *Medley Wood 324*, 11138 ; Winter's Kloof, Natal, *Doidge*, 2166 ; Rikatli, Mozambique, *Junod*, 11540 ; Xumeni Forest, near Donnybrook, *Morgan and Doidge*, 27729, 30475 ; Fountains Valley, Pretoria, *Bottomley and Lansdell*, 28621 ; Elim, Northern Transvaal, *Watson*, 28484 ; Nottingham Road, Natal, *van der Byl 541*, 31806.

On damp soil, Fountains Valley, *Reinecke*, 23170.

7. **Xylaria multiplex** (Kze. ex Fr.) Berk. & Curt.

Jour. Linn. Soc. 10 : 381. 1869.

*Sphaeria multiplex* Kze. ex Fr., Linnaea 5 : 532. 1830.

Stroma slender, simple or much branched from base or above, branches terete or flattened with apical sterile points ; with fertile clava, brown with raised lines, smooth.

with age almost black and uneven from perithecial projections, 10–30 × 1–2 mm.; with stipe slender, glabrous or tomentose, 3–30 mm. high and ·5–1 mm. in diameter; perithecia globose to ovoid with inconspicuous papillate ostiola; asci cylindric, p. sp. 65–80 × 6–7 μ with stipe 30–50 μ long; paraphysate; ascospores inequilaterally elliptic, brown, 9–12 × 4–5 μ.

Lloyd (24) and later van der Byl (1) confused this species with *X. ianthino-velutina* Mont. However, it grows on wood rather than fruits and has the same general appearance as *X. apiculata* and *X. arbuscula* and differs chiefly in the smaller spores.

*Material Examined.*

On bark and wood, Buccleuch, Natal, *Leighton*, 11694; Boschfontein, near Wolhuter's Kop, Rustenburg District, *Doidge and Bottomley*, 32151; Marwaqa Forest, near Bulwer, Natal, *Doidge*, 32152.

8. **Xylaria bulbosa** (Pers. ex Fr.) Berk. & Br.

Outl. Brit. Fung. p. 385. 1860.

*Sphaeria bulbosa* Pers., Obs. Myc. 2 : 63, tab. 1, f. 1, ad. 1799.
*Sphaeria bulbosa* Pers. ex Fr., Syst. Myc. 2 : 327. 1823.
*Sphaeria corniformis* Fr., Elench. Fung. 2 : 57. 1828.
*Xylaria corniformis* Fr., Summa Veg. Scand. p. 381. 1849.

Stroma cylindric-clavate, somewhat compressed or terete, simple or occasionally several from a common base; clava dark brown to black, very moriform from conic perithecial projections, glabrous, with apical sterile point, white inside, solid, 1·5 cm. high and 2–6 mm. in diameter, with short stalk 2–6 mm. high and 2–3 mm. thick, brown, glabrous with purple pannose bulbose base; perithecia small, closely packed, ovoid, with cylindric asci, p. sp. 55–67 × 7 μ, with stalk 40–50 μ long; paraphysate; ascospores navicular to elliptic, brown, 8–10 × 4–5 μ.

On wood.

This old Persoon name has priority over the later *corniformis* of Fries. Many of the specimens in herbaria named the latter are *bulbosa*. This form and *X. cubensis* and *X. castorea* usually have an enlarged base, and all three have spores of about the same size. *X. bulbosa* differs from *X. castorea* in possessing the moriform, projecting perithecia and pointed apex and from *X. cubensis* in these characters and in the absence of the smooth surface of the latter.

Van der Byl (2) describes both *X. castorea* and *X. corniformis* and it is not possible to determine from his descriptions the species, but his specimens at Stellenbosch are all *X. castorea*.

*Material Examined.*

On wood, Pillansberg, near Rustenburg, *Wager*, 23613.

9. **Xylaria ianthino-velutina** Mont.

Syll. Crypt. p. 204. 1856.

*Hypoxylon ianthino-velutina* Mont., Ann. Sci. Nat. 2nd ser. 13 : 348. 1840.

Stroma slender with acute sterile apex, cylindrical to compressed, single or occasionally dichotomously branched above, 2–6 cm. high and 1–1·5 mm. in diameter, fertile clava, dark brown to black, with brown tomentose hairs surrounding perithecia, later glabrous and strongly moriform from the rather wide perithecial elevations, white inside and solid; stipe short, black, villous with long brown hairs, 2–10 mm. high and 1 mm. in diameter; perithecia large, globose-flattened with small black papillate ostiola; asci cylindric, p. sp. 90–92 × 5–6 μ, with stipe 23–46 μ long; ascospores brown, straight to inequilaterally elliptic, 8–11 × 4–4·5 μ.

On parts of old fruits, especially legumes. Common in tropics.

The staghorn branching in part of the type, *Leprieur No. 574*, and also in No. 27727 below, is not typical, as most of the stromata are simple with long pointed apices.

This differs from the *arbuscula-multiplex* group in the lack of the split brown pellicle. It is more closely related to *X. Hypoxylon*, from which it is distinguished by the more prominent perithecia and longer sterile apices as well as differences of substrate.

The South African specimens are identical with those from South America and the southern United States in all characters except the spores, and they average somewhat smaller. This is probably sufficient to create a new variety.

Lloyd (24, 26) at first named this fungus *X. multiplex* and placed as synonyms every species with similar appearance and dichotomous branching irrespective of spore dimensions. However, the Weigelt specimen of *multiplex* and the Leprieur specimen are distinct, and Lloyd (29) later recognised this difference. Van der Byl (1) followed the earlier determination of Lloyd in naming his specimens *X. multiplex*.

*Material Examined.*

On fallen fruits of *Strychnos Gerrardi*, Stella Bush, Durban, *Bottomley*, 12315 (Lloyd as *X. multiplex*); Stella Bush, Durban, *van der Byl 665*, 31990.

On bark (substrate unrecognisable), Xumeni Forest, near Donnybrook, *Morgan and Doidge*, 27727.

10. **Xylaria Oxyacanthae** Tul.

Sel. Carp. Fung. 2 : 15, tab. 13, figs. 1–10. 1863.

*X. Fuckelii* Nits. Pyr. Germ. p. 7. 1867.

Stroma slender, dilated upward with sterile tip, usually simple, with clava terete or more often flattened, glabrous, with very small evident perithecial elevations, with surface grey to finally black, white inside, 2–4 cm. high and 1·5–3 mm. wide; with stipe ·5–2 cm. high, hairy, later glabrous, brown, with enlarged purple pannose base on seeds; perithecia small, densely crowded, ovoid, with small papillate ostiola; asci cylindric, p. sp. 70–80 × 6–7 $\mu$, with stipe 35–50 $\mu$ long; ascospores inequilaterally elliptic, dark brown, 10–12 × 4–5 $\mu$; paraphysate.

The stroma grows from seeds or old fruits buried in the soil. Common in Europe and America as well as Africa.

This differs from the other species on fruits in having spores 10–12 × 4–5 $\mu$, as against 12–16 × 5 $\mu$ in *X. carpophila* and 12–16 × 5·7 $\mu$ in *X. persicaria*. Then from *X. ianthino-velutina* it differs in possessing smaller more immersed perithecia, and in lacking the brown tomentose hairs and the long point to the club. There is no essential distinction between this species and *X. Hypoxylon* except that of the substrate.

Nitschke changed the name to *X. Fuckelii* because he found it on many fruits besides those of *Crataegus*. This would not be a valid reason for such action.

*Material Examined.*

On fruits, Fountains Valley, Pretoria, *Bottomley*, 20391.

11. **Xylaria Hypoxylon** (L. ex Fr.) Grev.

Flor. Edin. p. 355. 1824.

*Clavaria Hypoxylon* L., Sp. Pl. p. 1182. 1753.
*Valsa digitata* Scopoli, Flor. Carniol. 2 : 398. 1772.
*Clavaria hirta* Batsch, Elench. Cont. 1 : 229. 1783.
*Sphaeria cornuta* Hoff., Veg. Crypt. 1 : 11. 1787.
*Sph. digitata* Bolton, Fungi Halif. 3 : 130. 1791.
*Clavaria cornuta* Bull., Champ. Fr. tom. 1, p. 193, t. CLXXX. 1791.
*Sph. ramosa* Dicks, Plant. Crypt. Brit. 4 : 27. 1801.
*Sph. Hypoxylon* Fr., Syst. Myc. 2 : 327. 1823.

Stroma slender with sterile apices, compressed and dilated upward, occasionally terete, simple or more often divided from the base or above, 3–8 cm. high; fertile clava with black surface and white interior, glabrous, even or roughened with fairly prominent perithecial elevations, 10–40 mm. high and 1·5–3 mm. in width, with stipe short, 1–1.5 mm. in diameter, hairy but smooth with age; perithecia small, ovate, usually closely packed, with small papillate ostiola; asci cylindrical, p. sp. 70–80 × 6–8 $\mu$ with stipe 40–60 $\mu$ long; paraphysate; ascospores inequilaterally elliptic, dark brown, 10–14 × 4–5 $\mu$.

The perithecia are not in lines as in *X. multiplex* and are more deeply immersed in the stroma than in *X. ianthino-velutina* or *X. Oxyacanthae*. The stipe is often covered with long hairs, but smooth forms are also found that differ in no other respects. The writer has seen no mature specimens that could be determined accurately from South Africa, and most of the references have been based on immature forms. Common on sticks and bark all over the world.

The species has often been cited; for example, Cooke (7), Medley Wood (43) and Lloyd (28) describe it, but on immature specimens.

12. **Xylaria heloidea** Penz. & Sacc.

Malpighia 11 : 498. 1897 and Icones Fung. Javan. p. 30, tab. XXI, f. 3. 1904.

Stroma consisting of a semiglobose fertile head 1–1·5 mm. high and 1·2 mm. in diameter with an apical aristate prolongation up to 3 mm. in length, and a filiform stipe 7–20 mm. long and ·4–·7 mm. in diameter; clava dark brown glabrous, uneven from acute perithecial elevations; perithecia semiglobose with papillate ostiola; asci cylindric, p. sp. 70–95 × 7–8·5 $\mu$ and stipe 30–45 $\mu$ in length; ascospores navicular-elliptic, brown, 11–16 × 4·5–6 $\mu$;

The type is on rotted parts of legumes.

Lloyd (26, 27) describes this species from South Africa.

*Material Examined.*

On *Strychnos* sp., on rind of fruit, Rikatli, Mozambique, *Junod*, 11618. Det. Lloyd.

13. **Xylaria schroederiana** van der Byl.

Ann. Univ. Stell. 10 : 3. 1932.

Stroma in rather closely packed groups, consisting of a fertile clava, subglobose to short cylindric with a brief sterile pointed apex, dark brown to black, surface glabrous, slightly uneven from projecting perithecial elevations, white inside, up to 2 mm. in diameter; with short nearly filiform stipe, black, rugose, ·5 mm. thick and up to 5 mm. long; perithecia globose, black, ostiola not prominent; asci cylindric, p. sp. 120–180 $\mu$ with stipe 65 $\mu$ long ascospores monostichous, brown, navicular, 20–28 × 8 $\mu$.

This species differs from *X. heloidea* in less prominent ostiola and in larger spores.

On wood. Known only from type locality.

*Material Examined*

On dead wood, Knysna, *van der Byl 1365*.

14. **Xylaria aristata** Mont.

Ann. Sci. Nat. 4th ser. 3 : p. 107, t. 5, f. 6. 1855.

Stroma with semiglobose to short cylindric, aristate head, with elongate filiform stipe; clava light brown, glabrous, sharply tuberculate with protruding perithecial elevations; 1–3 mm. long and ·5–1 mm. in diameter, with glabrous, brown stipe 8–30 mm. long and ·3–·5 mm. in diameter, perithecia ovate, not crowded, with prominent papillate ostiola; asci cylindric, p. sp. 57–70 × 7 $\mu$ and stipe 35–47 $\mu$ long; paraphysate; ascospores inequilaterally elliptic, brown, 10–12 × 5–6 $\mu$,

On dead leaves.

This species differs from other species occurring on leaves as follows. *X. filiformis* possesses perithecia more or less scattered on the stem and they are not grouped in a definite head. *X. appendiculata* has similar spores and much the same type of head, but has an appendage at each end of the spore. Petch (41) describes *X. cocophila* Penz. & Sacc. from Ceylon, also on leaves, with spores 12–13 × 6–7 $\mu$. The spores of the type, however, are given as 9 × 3–4 $\mu$, and so it is possible that Petch had before him *X. aristata*.

*Material Examined.*

On dead leaves, Fountains Valley, Pretoria, *Parkes*, 21199.

15. **Xylaria vaporaria** Berk. & Curr.

Trans. Linn. Soc. 24 : 157, t. 25, f. 17. 1863.

Stroma consisting of a semiglobose to conic fertile head with pointed apex, 3–5 mm. high and 2–4 mm. in diameter, and a long filiform subterranean stipe, 5–7 cm. long and ·5–1·5 mm. in diameter; clava dark brown glabrous but roughened with fragariform perithecial elevations; perithecia with faintly papillate ostiola each in centre of a light cinnamon ring; asci broadly cylindrical, 190–240 $\mu$ long and 20–30 $\mu$ wide with very brief stipe; paraphysate; ascospores dark brown, broadly elliptical, 40–50 × 18–23 $\mu$, surrounded by hyaline sheath.

A connection between the stipe and the subterranean sclerotium has been demonstrated, but is not evident in the specimens cited below.

No. 2459 is exactly like the English type at Kew Herb., and both are very near *X. pedunculata* Dicks. ex Fr. Lloyd (30) fig. 2876 is the type of the latter and figs. 2877 and 287[illegible] are from the type of *X. vaporaria*. No. 30922 is sterile, a much branched sclerotial mass that may belong here.

*Material Examined.*

In Chrysanthemum beds, Krantzpoort, Ermelo, *de Villiers*, 2169.
From mushroom beds, Durban, African Mushroom Industries, 30922.

16. **Xylaria nigripes** (Klotzsch) Cke.

Grev. 11 : 89, 1883 and Sacc. Syll. Fung. 9 : 527, 1891.

*Sphaeria nigripes* Klotzsch, Linnaea 7 : 203, 1832.

Stroma slender, cylindrical, with obtuse apex, with long subterranean filiform stipe, arising from sclerotium; fertile clava terete, light brown, becoming black with age, glabrous, sharply tuberculate with perithecial projections, 1·3–5 cm. in length and 2·4 mm. in diameter, with stipe glabrous, rugose, up to 9 cm. in length and 1·5 mm. in diameter; sclerotia globose to tuberous, black, 2·3 cm. in diameter or [illegible] cm. perithecia small globose to ovate, about 250 $\mu$ in diameter, with prominent papillate ostiola; asci cylindric, p. sp. 28–32 × 4·5–5 $\mu$ with stipe about 14 $\mu$ in length; paraphysate; ascospores very small, broadly elliptic, dark brown, 4·5 × 2·5–3 $\mu$.

From old termite nests. Africa and Asia.

Petch (40) describes the sclerotium and also the perithecial stroma and Lloyd (21) illustrates the sclerotium and later he (26) cites the fungus from South Africa. No. 8807 below was determined by Lloyd. Cooke (l.c. pl. 163, fig. 23) also gives a good illustration of the fertile club and spores.

*Material Examined.*

Among grass, Botanical Gardens, Durban, *Medley Wood*, 7766 and 9198 (fertile.)
On comb of *Odontotermes badius*, Daspoort, Pretoria, *Kreisfelder*, 20368; without locality, *Fuller*, 11327 (sclerotia).
In old termite nests, Pretoria, *Pole Evans*, 8807, det. Lloyd; Wolhuter's Kop, *Maguard*, 15425 (sclerotia); Standerton, *Murray*, 29712; Pietermaritzburg, *Fuller*, 1900 (fertile) Toowoomba, Warmbaths, *Trevine*, 28646 (fertile).

17. **Xylaria castorea** Berk.

Flora New Zealand 1 : 204, tab. CV, f. 10, 1855.

Stroma stout, often compressed obovate, but more rarely clavate-terete, with obtuse fertile apex, black, rugoso-scaly, and inside white and solid; with very brief constricted stipe usually bulbose at base and purple pannose, 2–6 cm. high and 1·5–3 cm. wide; perithecia ovate to semiglobose not crowded, with obtuse prominent black ostiola; asci cylindrical, p. sp. 50–65 × 6–7 $\mu$ with stipe 30–45 $\mu$ long; paraphysate; ascospores inequilaterally elliptic with rounded end, dark brown, 7–10 × 4–5 $\mu$.

This species and *X. bulbosa* have often been named *X. cornuformis*. It differs from *X. bulbosa* in possessing a more rounded apex and less prominent perithecia. The general habit is much like *X. polymorpha*, and could well be considered a small spored form of that species. The ostiola are large and quite obtuse and the shape of the stroma varies from terete to very wide and compressed and often it is fasciculately branched from the base.

South African references to *X. castorea* are Lloyd (29) van der Byl (2) and Hopkins (11).

*Material Examined.*

On *Millettia Sutherlandi*, on wood, St. Johns, *District Forest Officer*, 6929.
On wood, Eshowe, Zululand, *Rump 3856*, 30239.
On wood, Knysna, *Duthie* (*van der Byl 1103*); "Tuin van Eden", Knysna, *van der Byl 2224*; Knysna, *van der Byl 2254*, *2260* (all sub *X. Cornuformis* in Herb. van der Byl).
On rotten wood, Knysna, *van der Byl 1329* (sub *X. hippoglossa* in Lloyd Herb. No. 11874).

18. **Xylaria anisopleura** Mont.

Syll. Crypt. p. 204, 1856.

*Sphaeria anisopleura* Mont., Ann. Sci. Nat. 2 ser. 13 : 348, 1840.

Stroma stout, with rounded fertile apex, extremely variable in shape, from semiglobose and always sessile to stipitate, 3–5 cm. high and broadly clavate; clava black, tuberculate from broad perithecial elevations, solid and white inside with stipe represented by a brief central attachment or short and thick, dark brown, at first tomentose then glabrous

perithecia in periphery, ovate, with small black papillate ostiola, often indistinct; asci cylindrical, p. sp. 161–172 × 11·5 μ with stipe 50 μ long; paraphysate; ascospores oblong-elliptic, brown, 25–33 × 7–10 μ.

The South African specimen cited below is the small hypoxyloid form of this species and is closely related to, if not identical with *X. haemorrhoidalis* B. & Br. from Ceylon. Semiglobose forms with a flat base as described by Petch (41) when considered alone would be placed in Penzigia, but as this species is just as often globose-clavate to almost cylindrical with a distinct stipe, it will have to remain in Xylaria. The tuberculate, fragariform stromal surface distinguishes it from hypoxyloid forms of *X. polymorpha*.

Van der Byl (1) describes this species, but no specimen was found in his herbarium. Lloyd (21) has listed synonyms and later (29) fig. 2700 illustrated the part of the type at Kew.

*Material Examined.*

On log, Winter's Kloof, Natal, *Doidge*, 2551.

19. **Xylaria polymorpha** (Pers. ex Fr.) Grev.

Flor. Edin. p. 355. 1824.
*Valsa clavata* Scop., Carn. 2 : 398. 1772.
*Clavaria digitata* Bull., Hist. Champ. Fr. 1 : 192. t. 220. 1791.
*Sphaeria polymorpha* Pers., Obs. Myc. 2 : 64, t. 2, f. 2–5. 1799.
*Sphaeria polymorpha* Fr., Syst. Myc. 2 : 326. 1823.

Stroma erect, thick-clavate and 2–12 in a fasciculate group from a common base, or subglobose and variously undulate and deformed, with rounded fertile apices; fertile clava rugulose-roughened, black, glabrous, but with perithecia evident in age, solid, white inside, 3–10 × ·6–1·5 cm. or 2–4 cm. high and 1–3 cm. wide, with thick abbreviated stipe or almost none, dark brown, ·5–4 cm. high and ·4–1 cm. thick; perithecia ovate to globose in periphery with very obtuse dark ostiola; asci cylindric, p. sp. 150–175 × 7–9 μ, with stipe 30–45 μ long; paraphysate; ascospores subfusiform to elliptic with obtuse ends, brown, 25–34 × 6–8 μ.

As with the two previous species, there is no definite shape concept that will characterise this species. The type, *Persoon No. 235*, at Leiden, is branched from the base and is very similar to No. 9046 cited below. Lloyd (26) determined this as *X. pistillaris*. That name was set up by Nitschke for a variety of *X. polymorpha*, characterised by upright more or less terete branches, but it has no merit as it indicates only an environmental form. Kalchbrenner (12), Lloyd (19) and van der Byl (1) have described the species from South Africa.

*Material Examined.*

On stump of stinkwood, *Ocotea bullata*, Knysna, *Laughton* (*van der Byl 253*).
On *Royena lucida*, Amatola Mts., Cape, *Keet*, 9046 (Det. Lloyd as *X. pistillaris*).
On wood, Buccleuch, Natal, *Leighton*, 11695; Eshowe, Zululand, *Rump 385b*, 30239; Bluff, Durban, *Moonsamy* (*van der Byl 365*) 31704; Durban, *van der Byl 213, 310*.

*Excluded Xylaria Names.*

There are some other specific names in South African literature that are either based on indeterminate conidial stages, or on types that have not been studied by the writer. In any case they are listed below and reasons for their exclusion from the previous systematic account are given.

1. **Xylaria allantoidea** Berk.

Described by Hopkins (11) from a specimen found on stem of *Brachystegia* sp., Umtali. The writer has not seen this collection.

2. **Xylaria capensis** (Lev.) Sacc.

No specimen was available for study.

3. **Xylaria carpophila** Pers. ex Fr.

Cited by Henning (9) on fruits of a *Strychnos* sp., Tugela River, Natal. The only specimens examined on such fruits are those determined as *X. ianthino-velutina* and *X. helvidea*.

4. **Xylaria corniformis** Fr.

This name is a synonym of *X. bulbosa*, but the van der Byl (2) specimens belong under *X. castorea*.

5. **Xylaria digitata** (L. ex Fr.) Grev.

Described by Welwitsch and Currey (Trans. Linn. Soc. 26 : 287, 1868) on *Welwitsch No. 136b*, Mossamedes, and also by Lloyd (26) from No. 8976, Hennops River, eeg. van der Byl.

There is some question concerning the proper concept for this species. Lloyd (29) accepts a fungus with few or many clubs rising from a common base or even solitary, glabrous, with quite protruding perithecia, and spores about 18–20 × 5–6 $\mu$. Then he considers this the same as the American *X. cornu-damae* (Schw.) Berk.

The general habit of *X. digitata* and *X. cornu-damae* is the same, but the spores of the latter average somewhat longer, up to 25 $\mu$, and so the writer considers them distinct.

The concept of *X. digitata* is not that of Persoon as indicated by Lloyd, but comes from a Berkeley specimen labelled *Sphaeria digitata* Ehrh., Lavender Hill, W. Pamplins This one fully equals Lloyd's description as given above, but the Persoon specimens in Leiden and most of the Berkeley collections are immature fasciculate forms of *X. polymorpha*.

The writer has not seen *Welwitsch No. 136b*, but has studied the van der Byl collection, No. 8976 in the Pretoria Herbarium, and the same one in the Lloyd Herbarium. The latter come within the general concept of the species according to the Berkeley specimen, but differ in the spores, which are too small, 9–11 × 4–5 $\mu$. This is sufficient to warrant another specific name.

6. **Xylaria fistulosa** (Lev.) Fr.

This was described by Lloyd (17) from *Duthie 51*, on rotting log, Knysna Forest. No specimen has been found in the Lloyd Herbarium, and so the writer has not studied it. Van der Byl considers it equal to *X. tabacina*.

7. **Xylaria hippoglossa** Speg.

Lloyd (30) determined a van der Byl collection from Knysna, No. 11874, as this species. Van der Byl (3) also describes the specimen. The collection has spores 8–11·5 × 4–5 $\mu$ and is a typical *X. castorea*.

8. **Xylaria Myosurus** Mont.

Both Lloyd (29) and van der Byl (2) cite this name, but base it on immature material. The Lloyd specimen, *No. 12773*, has not formed perithecia, and it is impossible to guess at its identity.

9. **Xylaria rhopaloides** Mont.

This name has been cited from South Africa by Cooke (7), Kalchbrenner (14), Wood (43) and Lloyd (20, 30).

The Medley Wood collection, *Medley Wood 346*, 11137 in the Pretoria Herbarium, is conidial and indeterminable. The Lloyd specimen, *No. 11887*, from van der Byl, Stellenbosch, is identical with Lloyd's *X. reticulata*. The writer has not seen the type of this species.

10. **Xylaria Schweinitzii** Berk. & Curt.

Cited by Lloyd (23, 28) and van der Byl (2) on rotting wood, Knysna. Van der Byl had old specimens, and so finding no spores, preferred to wait for a positive identification. The writer has not found this species among the African collections.

11. **Xylaria stilboides** Kalch. & Cke.

Described by Kalckbrenner and Cooke (13) on *MacOwan 42*. The writer has not seen these specimens.

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# A REVISION OF THE SOUTH AFRICAN MICROTHYRIACEAE.

By Ethel M. Doidge.

The first reference to a fungus belonging to the *Microthyriaceae* collected in South Africa appears to be a description of *Asterina sphaerasca* by von Thumen (44) No. 119 of his Fungi austro-africani, published in *Flora*, 1878. This fungus was found by MacOwan (*MacOwan 1273*) at Olifants Hoek in the Uitenhage district. A number of specimens collected by MacOwan in the eastern Cape and by Medley Wood in Natal were described by Kalchbrenner and Cooke in numbers of *Grevillea* published 1880–1882, and later the number of known South African species was increased by Sydow, who described specimens sent to him from the Pretoria Herbarium. In 1920 (Doidge 9) a study of the *Microthyriaceae* in the Cryptogamic Herbarium at Pretoria was based on Theissen's papers in the *Annales Mycologici* and elsewhere (36-40) and on his monograph of the genus *Asterina* (41). In more recent years, fairly extensive collections have been made, and some of the fungi have been described from time to time (Sydow 34, van der Byl 4–6, Doidge 11–13). It has long been evident, however, that a more critical study of the South African members of the *Microthyriaceae* is desirable. Not only is more abundant material now available, but great advances have been made in the study of the phanerogamic flora, and it has been possible to revise the identification and nomenclature of the host plants. This is a matter of considerable difficulty, as it is unusual to find either flowers or fruit on the plants when the fungi are mature. In earlier days a number of mistakes were made in identification of the hosts, and this led to some confusion amongst the species of fungi. I am indebted to my colleagues in the phanerogamic herbarium for their kind and willing co-operation in the revision of the hosts, and particularly to Miss I. C. Verdoorn and Miss H. Forbes, who examined and identified a large number of difficult specimens.*

## CHARACTERS OF THE GROUP.

In recent years, the views of mycologists on the value of certain characters for diagnosis have undergone some modification, and it has been found that some of them, such as the presence or absence of paraphyses, are untenable as generic distinctions. A brief review of the characters of the family in the light of recent investigations may be of interest.

### Spore germination.

In most of the genera studied, the spores are brown, 2-celled and more or less constricted at the septum. The spore usually germinates from the upper or lower end or from both ends (Theissen 41). In some cases, a hypipodium is first formed, and in close proximity to this a hypha emerges, which grows out and recedes to form the more or less extensive superficial mycelium; this method commonly occurs in the species of *Asterina*. In other cases, the 'primary' hyphopodium does not appear, but hyphae grow from either end of the spore, and on these hyphopodia are formed early, e.g. *Asterina Bottomleyae*. Sometimes germination takes place near the septum as in *Asterina dissiliens*. In many species, particularly in the genus *Asterina*, the spore can long be seen unchanged in the centre of the fungus colony, and mature spore characters can often be studied from this when spores still in the thyriothecia are more or less immature (41). In a number of species with node cells and lacking typical hyphopodia on the hyphae, the spores are thin-walled; on germination, a single, 1-celled hyphopodium develops near the upper end; then the spore collapses, two or more hyphae grow from the base of this primary hyphopodium and extend to form the superficial mycelium (Plates LXI, LXII). In some species it frequently happens that the spores germinate in the ascus.

As a rule, the developing mycelium very early assumes its mature characters, especially the definite colour, breadth and septation of hyphae and the form of branching, but less frequently there is a distinct difference between old and young hyphae; colour deepens with age, and mature hyphae may differ in breadth and septation from those recently developed.

* Door die goedgunstigheid van die trustees van die van der Byl Herbarium en van die Stellenbosse Universiteitsraad is 'n geleentheid vir die bestudering van hierdie groep swamme aangebied, wat in die versamelings van wyle Dr. van der Byl to vinde is. Verwysing na hierdie monsters sal in verband met die verskillende soorte gevind word.

### Mycelium.

The *Microthyriaceae* have been characterised by Theissen and Sydow (43) as fungi with superficial ascomata and 'free mycelium' when present, also superficial. Arnaud (3), however, points out that these fungi are parasites and that the absorbing apparatus of superficial forms has been incompletely studied. In the genera under consideration, the absorbing apparatus is much reduced, and is usually represented only by haustoria, which penetrate the epidermal or palisade cells of the host. The haustoria of the superficial fungi have been studied by Marshall Ward (45), Maire (24) and Arnaud (1–3). The superficial mycelium develops centrifugally on the surface of the host, and consists of brown, cylindrical hyphae which are septate at fairly regular intervals, usually branch and anastomose freely, and finally become more or less closely reticulate. In colour the hyphae range from chestnut brown to olive brown and even greyish olive. Colour is often characteristic, and in this paper an attempt has been made to indicate colour as precisely as possible by comparison with Ridgway's colour charts (30). The external mycelium is in close contact with the host; cells from which haustoria develop are sometimes ordinary hyphal cells; more frequently this rôle is assumed by special cells of the hyphae, termed stigmocysts by Arnaud (3), which may be distributed along the hyphae and are then known as node cells, or on short special branches known as hyphopodia (Theissen 41) or stigmopodia (Arnaud 3). These special cells are usually more or less distended, but vary greatly in form in different species and may even have a slender extremity; their essential character is a small, paler spot, more or less conspicuous, which marks the point of emergence of the filament penetrating the cuticle to form the haustorium in the leaf tissues. The form of the hyphopodia is remarkably constant in the same species of the *Microthyriaceae*, and is a good diagnostic character (41).

### Thyriothecia.

The thyriothecia develop on the mycelium in at least two ways (Theissen 41, Doidge 9 and Ryan 31). The first and most common method is from an intercalary cell of a hypha in which cross septa appear, thus forming two or more small, cubical cells—rarely more than 5—which give rise to bud-like growths, often lobed on their free margins and developing centrifugally. In the second method, the thyriothecium arises from the terminal cell of a short, lateral branch. Ryan mentions also a third method, more common in the genus Meliola, in which the thyriothecium develops from a hyphopodium. The thyriothecia are either circular in outline, or more or less elliptical to linear. Intermediate forms are found, and occasionally all forms, from round to linear can be found in the same species, or even on the same leaves. In some species (41) the thyriothecium has a distinct basal membrane, which is pale grey or fuscous, composed of radiating hyphae and a fairly exact copy of the covering membrane. This is sometimes firm, but often delicate and transient, so that it is easily destroyed by pressure, or traces of its presence only discernible at the edge of the ascoma.

The covering membrane is formed of radiating hyphae, which may be straight or more or less sinuous. It may open by means of a pore (Microthyrium) or, closed at first, break into triangular segments by the formation of radiating, stellate cracks (Asterina) or, in the case of linear ascomata, form a longitudinal fissure running almost the length of the covering membrane. In certain species, the covering membrane becomes strongly convex through the formation of a quantity of mucilage from the break-down of paraphysoids and other internal cells; the central part of the covering membrane then dissolves into mucilage and disappears almost entirely, leaving the asci embedded in a dirty brown, mucilaginous mass. Between the typical forms dehiscing by cracks and those in which the covering membrane is dissolved, there is a series of transition forms (Sydow and Petrak, 35 p. 246).

Typical paraphyses are sometimes found, which are regularly septate, sterile threads of limited length between the asci, often somewhat clavate at the tips and agglutinated (41). It is difficult in many cases to establish the presence of true paraphyses and to distinguish them from other sterile, intrathecial hyphae known as paraphysoids; in most genera, even those said to be characterised by the absence of paraphyses, definite, if sparse, paraphysoids are always present (Petrak 26).

### Conidia.

The Asterostomella fructification, which is the pycnidial form of the genus Asterina, is well known. It has pycnidia similar in form to the thyriothecia, but usually smaller,

and continuous conidia, in which the brown colouring is continuous or is interrupted by a lighter or hyaline zone. These conidia vary in form and size and in their method of germination to a greater extent than indicated by Theissen (41). The pycnidial forms of other genera are not so well known. It is probable that a number of general classified with the superficial *Leptostromaceae* and placed in the group *Pycnothyriae* by von Höhnel (16) and Diedecke (8) are conidial forms of *Microthyriaceae*, but they have not been connected with the ascus forms. The pycnidial form of *Lembosiopsis eucalyptina* has been named by Petrak and Sydow (29) *Thyrinula eucalyptina*.

In the South African species of *Lembosia* and *Echidnodes* a number of conidial forms were found. The hyaline, ellipsoid conidia of *Echidnodes africana* resemble those of *Peltaster* Syd. (Ann. Myc. 15, 1917, p. 261); in *Ech. Hypolepidis*, the conidia are ovate or ellipsoid and olive buff, and possibly may be linked with the genus Asteromula Theissen (42), which is an ahyphopodiate *Asterostomella*. The genus *Actinothyrium* P. Henn. (15) has 3-septate, hyaline, oblongfusoid conidia like those of *Ech. Acokantherae*. In *Lembosia piriensis* the pycnidial conidia are hyaline, bacillary; bodies similar to these have recently been described and figured by Luttrell (23) in *Morenoella quercina* as 'spermogonia', but proof of the nature and function of these bodies is lacking. Marshall Ward (45) described the formation of spermatia in *Asterina spissa*, but according to him erect clusters of delicate hyphae are produced on the mycelium and on the young thyriothecia; he was in doubt as to the nature of these structures, because of the difficulty in determining their exact relation to the mycelium. Arnaud (3) figures small hemispherical bodies in *Morenoella Mollenidiae*, similar to those found in *Lembosia piriensis* and *L. durbana*, but no reference is made to them in his text. There is no evidence that these have any sexual significance, or that they are other than pycnidia. In the genus *Clypeolella*, the conidia are 3-septate, usually brown, and are borne on the mycelium; dark mycelial conidia, 6–12-septate, were also observed in *Lembosia piriensis*.

It is possible that the varying conidial forms may be of value in grouping species, but further studies in this direction are needed.

## CLASSIFICATION.

In their *Synoptische Tafeln* (4), Theissen and Sydow include in the Hemisphaeriales ascomycetes with flat, shield-shaped, dimidiate ascomata which are superficial or covered by the cuticle. Within this group, the *Microthyriaceae* are distinguished by their superficial ascomata and superficial "free" mycelium; fungi with superficial ascomata attached to an intramatrical hypostroma are placed in the *Polystomellaceae*. Arnaud (3), however, regards the *Polystomellaceae* as defined by Theissen and Sydow as large *Microthyriaceae* with plurilocular stromata and a more extensive intramatrical absorbing apparatus. He states that one finds intermediate forms which establish a gradual transition between the two types of stroma. The presence of superficial mycelium is in correlation with the humidity of the climate of regions where these fungi are found; they occur almost exclusively in tropical regions with a high rainfall, or in humid mountainous districts of more temperate regions. Arnaud contends that the belief in the absence of an intramatrical absorbing apparatus in the small *Microthyriaceae* is the result of incomplete investigation.

The present paper is restricted to forms included by Theissen and Sydow in the Microthyriaceae, and their classification is followed, with some modifications.

### Generic Characters.

The largest number of the species found in South Africa belongs to the genus *Asterina*, which must now be taken to include the genera *Parasterina* and *Englerulaster*. Petrak (26) has pointed out that the presence or absence of paraphyses or paraphysoids alone cannot be used as a generic distinction between hemispherical forms. For example, *Asterina*, a genus in which paraphyses are said to be wanting, always has definite, if somewhat sparse, paraphysoids. The fact that these are numerous in *Parasterina* is therefore without generic significance and the genus *Parasterina* cannot be maintained; but as the species with definite, typical paraphyses resemble one another in a number of ways *Parasterina* may be retained as a section of the genus *Asterina*. For the same reason, the genus *Morenoella* must be united with *Lembosia*, and *Prillieuxina* with *Asterinella*.

The only difference between a typical *Asterina* and a typical *Englerulaster* is that in the latter genus the covering membrane of the thyriothecium becomes strongly convex through the mucilaginous dissolution of internal hyphae and is itself dissolved. Between this and the typical *Asterina* with stellate dehiscence there is a series of transition forms which are difficult to place. Englerulaster can probably be maintained as a section of

*Asterina* (Sydow and Petrak 35). The third section of the genus, *Clypeolaster*, is characterised by the presence of a basal membrane in the thyriothecium. This is readily recognisable when it is firm and definite, but it is possible that it may be overlooked in species where it is delicate or transient (41).

The genus *Seynesia* cannot be included in the *Microthyriaceae*, as Petrak (27) has pointed out that the type species of the genus, *Seynesia nobilis*, is identical with *Steganopycnis oncospermatis* and is a typical *Sphaeriaceae*. The genus *Arnaudiella* Petrak (27) has been established for *Microthyriaceae* with little or no superficial mycelium, radiating covering membrane with central pore and 2-celled dark spores, and *Ferrarisia* Petrak to include forms with 2-celled dark spores previously known as Seynesia spp.

The genus *Amazonia*, which is placed in the *Synoptische Tafeln* between *Halbania* and *Yatesula*, although it has an ascoma with slightly convex, radiating covering membrane, is not related to these genera but to *Meliola*, to which it approximates in habit and in development (Petrak 25). The single South African species of this genus, *Amazonia asterinoides*, originally named *Meliolaster Mackenzii* Doidge (10), has been described in a paper on the *Meliolineae* (14).

Mycelial characters are used as generic distinctions in this group. *Asterinella*, for instance, resembles *Asterina* but has no hyphopodia. Theissen includes forms with node cells, or intercalary stigmocysts, in the genus *Asterina*, but Arnaud regards this character as one of generic importance, and established a series of genera with "node cells" and elongated or round thyriothecia. Of these, *Asterolibertia*, comprising the species of the section *Nodulosae* of Theissen's sub-genus *Dimerosporium*, has been adopted for two South African species; these differ from *Asterina*, not only in the form and position of the stigmocysts, but in general habit and in spore germination.

Mycelial setae are rare in this group, but Arnaud (3) established the genus *Trichasterina* for a species, *Trichasterina Styracis*, with distinct mycelial setae. One species of this genus has been found in South Africa.

## MICROTHYRIACEAE Sacc.

Syll. Fung. II (1883) p. 658. Theissen and Sydow, Ann. Myc. 15 (1917) p. 413.

Superficial mycelium septate, brown, reticulate, often with hyphopodia, or quite wanting; intramatrical mycelium much reduced and often only represented by haustoria. Ascomata (thyriothecia) superficial, scutate; covering membrane radial in structure, formed under a hypha, consisting of one or more layers of cells, dehiscing from the apex by an irregular circular pore, or by stellate or longitudinal fissures, sometimes the central portion becomes mucilaginous and breaks down irregularly ("mucose diffluent", Stevens and Ryan 32). Hypothecium flat or concave, colourless, thin, filamentous. Basal membrane thin, formed of a single layer of cells, or wanting. Asci basal, erect, parallel, or somewhat convergent, with or without paraphyses, broadly clavate or ovate, seldom cylindrical, without a pore. Epithecium, or agglutinated paraphysal layer, wanting, atypical or typical. Hymenium polyascous, one or more under one covering membrane, seldom monascous.

KEY TO SOUTH AFRICAN GENERA.

A.—No superficial mycelium.....Sub-family *Microthyriae* Sacc. and Syd.
  (*a*) Thyriothecia rounded, spores 2-celled.
    1. Spores hyaline, thyriothecia with central pore.
      x. Thyriothecia closely crowded and more or less completely fused... 1. *Calopeltis.*
      xx. Thyriothecia separate, sometimes confluent but not fused..... 2. *Microthyrium.*
    2. Spores brown..... 3. *Ferrarisia.*
  (*b*) Thyriothecia linear, spores brown..... 4. *Lembosina.*
B.—Superficial mycelium present.....Sub-family *Asterineae* Sacc. and Syd.
  (*a*) Thyriothecia rounded.
    1. Spores 2-celled, brown.
      x. Typical hyphopodia present.
        o. Mycelial setae present..... 5. *Trichasterina.*
        oo. No mycelial setae.
          /. Conidia, when present, pycnidial, 1-celled..... 6. *Asterina.*
          //. Conidia mycelial, 4-celled..... 7. *Clypeolella.*
      xx. No typical hyphopodia.
        o. More or less swollen node cells distributed throughout hyphae 8. *Asterolibertia.*
        oo. Hyphae more or less even in thickness, no specialised node cells 9. *Asterinella.*
  (*b*) Thyriothecia linear.
    1. Spores 2-celled, hyaline, no hyphopodia..... 10. *Lembosiopsis.*
    2. Spores 2-celled, brown.
      x. Hyphopodia present..... 11. *Lembosia.*
      xx. Hyphopodia lacking..... 12. *Echidnodes.*

## CALOPELTIS Syd.

Ann. Myc. 23 (1925) p. 393.

No superficial mycelium. Thyriothecia densely crowded and often more or less completely fused, with a common, hyaline or sub-hyaline basal layer. Covering membrane radial in structure, composed of a single layer of cells, at first closed, then developing an irregular central pore. Asci fairly numerous, clavate, thick-walled, sessile, 8-spored. Spores broadly oblong-clavate, 1-septate, hyaline. Paraphysoids few, fibrose.

**Calopeltis Jasmini** Doidge nov. spec. [Plate I.]

No superficial mycelium. Thyriothecia epiphyllous, densely crowded, forming more or less circular black spots up to 5 mm. diam.; frequently the centre of the spot is very dense, consisting of a more or less completely fused aggregate of thyriothecia 2–2·5 mm. diam., surrounded by a ring of younger thyriothecia, which are at first scattered, but early become fused in irregular groups as they develop. There is no discoloration of the leaf tissues.

Single thyriothecia more or less circular to angular, 100–150 $\mu$ diam. Compound covering membrane, composed of fused membranes of single thyriothecia; each individual membrane slightly convex, about 50 $\mu$ high in the centre, at first isabella colour to snuff brown,* becoming blackish brown, subopaque, but remaining paler in the centre and at the margin when the latter is free; usually completely fused and continuous with the covering membranes of adjacent thyriothecia; formed of radiating, irregularly sinuous hyphae 2–2·5 $\mu$ thick, central cells thin-walled, almost cubical, 2–3 $\mu$ long, loosely compacted, breaking down to form an irregular central pore 15–20 $\mu$ diam., cells near margin up to 15 $\mu$ long; free margins irregular and sometimes sub-fimbriate. Asci 8-spored, clavate or ellipsoid, straight or slightly curved, broadly rounded above, tapering more or less towards the sessile base, with a firm wall slightly thickened round the apex, 40–50 × 12·5 to 15 $\mu$. Spores more or less distichous, oblong-clavate, broadly rounded above, tapering gradually downwards, 1-septate, not constricted or very slightly so, smooth, hyaline, 12·5–16 $\mu$ long, upper cell ovate, 4–5 $\mu$ long and 4·5–5 $\mu$ broad, lower 7·5–10 $\mu$ long, 3·75–4·5 $\mu$ broad at the septum. Paraphysoids sparse, fibrose.

On *Jasminum streptopus* E. Mey., on leaves, Durban, *Medley Wood*, 9516.

## MICROTHYRIUM Desm.

Ann. Sci. Nat. XV (1841) p. 138.

No superficial mycelium. Thyriothecia superficial, scattered or in groups, brown, radial in structure with a central pore. Hymenium simple, polyascous. Asci clavate, thick-walled, 8-spored. Spores 2-celled, hyaline.

KEY TO SPECIES.

A.—Thyriothecia 240–260 $\mu$ diameter, spores ranuliform..... 1. *M. ranulisporum.*
B.—Thyriothecia 150–200 $\mu$ diameter, spores ellipsoid..... 2. *M. maculicolum.*

1. **Microthyrium ranulisporum** Doidge.

Bothalia II (1927) p. 235. [Plate IIa.]

No free mycelium. Thyriothecia hypophyllous, scattered or in small irregular groups, visible to the naked eye as fine black points. Thyriothecia discrete and circular in outline, 240–260 $\mu$ diam., or becoming confluent in pairs or small groups. Basal layer hyaline, structure not evident. Covering membrane pellucid, deep olive buff at the margin to buffy brown in the centre, slightly convex, about 30 $\mu$ high in the centre, with an irregularly round central pore ca. 20–30 $\mu$ diam.; composed of irregularly radiating, undulating and more or less tortuous hyphae 2–3·5 $\mu$ thick, margin very irregular, sometimes subfimbriate. In the young thyriothecia, the central cells which break down to form the pore are almost cubical; elsewhere the cells are longer, often 10–15 $\mu$ long. Asci very numerous, 8-spored, oblong-clavate, rounded above, tapering slightly or more definitely to a sessile base, 90–100 × 10–14 $\mu$, not staining blue with iodine. Spores distichous, hyaline or flavescent, clavate, straight or slightly curved, like tadpoles in shape, 1-septate, very slightly constricted, 25–30 $\mu$ long; upper cell ovate, 6·5–8·5 $\mu$ long and 3·5–5 $\mu$ broad, lower cuneate, often curved or bent, 16·5–23·5 $\mu$ long, 3 $\mu$ broad at the septum and tapering downwards to ca. 1 $\mu$. Paraphysoids fairly numerous, hyaline, fibrose, sub-persistent.

On *Scolopia Mundtii* Presl., on leaves, Komgha, *E. P. Phillips*, 14152.

* For colour names in all descriptions *cf.* Ridgway (30).

2. **Microthyrium maculicolum** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 241, 280, Pl. XVIII, fig. 40.

Sub *Microthyrium annuliforme* Syd. in Stevens and Ryan The Microthyriaceae (1939) p. 20. [Plate IIb.]

No free mycelium. Thyriothecia epiphyllous, on leaf spots which are 4–8 mm. diam., or up to 10 mm., wood brown, becoming avellanous in the centre, slightly raised, blister like. Thyriothecia developing in a ring near the edge of the spot, numerous, irregularly placed, discrete or confluent in small groups, circular in outline, 150–200 $\mu$ diam., or flattened by contact and irregular. Covering membrane slightly convex, snuff brown to buster, pellucid, formed of straight, radiating hyphae 3·5–5 $\mu$ thick; central cells almost cubical, 3·5–5 $\mu$ long, marginal cells up to 8 $\mu$ long or rarely up to 10 $\mu$; margin entire, smooth or slightly and irregularly crenate. Asci 6–8 spored, not numerous, usually 3–7 in each thyriothecium, ellipsoid, 70 × 27 $\mu$, or, more frequently, ovate, broadly rounded above, tapering downwards to a sterile base, 50–57 × 30–43 $\mu$; uniformly thinly tunicated, wall ca. 1 $\mu$ thick. Spores conglobate, hyaline, ovate-ellipsoid, broadly rounded at both ends, 1-septate, not constricted, 19–25 $\mu$ long; upper cell larger, 10–15 $\mu$ long and 10–11·5 $\mu$ broad, lower 9–10 $\mu$ long and 7·5–9 $\mu$ broad. Paraphyses sparse, fibrose.

On *Capparis citrifolia* Lam., on leaves, Durban, *Bottomley*, 11668.

Stevens and Ryan (l.c.) consider this species identical with *M. annuliforme* Syd., an Indian species occurring on Capparis. Judging by the description the two fungi are very similar, but there are a number of minor differences. Authentic material of *M. annuliforme*, has not been available for comparison, and it seems preferable to retain the name *M. maculicolum* for the South African fungus until a comparison can be made.

**FERRARISIA** Sacc. emend. Petrak.

Sacc., Atti dell'Accad. Veneto-Trentino-Istriana X (1917) p. 61

Petrak, Ann. Myc. 25 (1927) p. 343.

Superficial mycelium none, or very sparse and transient, consisting of thin walled, subhyaline or very light olive brown, obscurely septate hyphae. Thyriothecia in groups often numerous and closely crowded and then becoming more or less confluent, usually somewhat angular and irregular in outline or slightly elongated, seldom almost circular; basal layer subhyaline, almost structureless; covering membrane dark brown, small celled, radial at the margin, at first quite closed, finally breaking into a few obtuse, triangular portions through the formation of irregular or stellate cracks. Asci spherical or broadly ovate, 4–8-spored, with a thick, firm wall, sessile, immersed in a subhyaline or light olive brown, indefinitely filamentous, paraphysoidal, mucilaginous mass. Spores oblong, 1-septate long remaining hyaline, finally pellucid olive brown or blackish brown.

**Ferrarisia Jasmini** Doidge, nov. spec. [Plate IIIa.]

No persistent superficial mycelium. Thyriothecia amphigenous, mostly epiphyllous, sometimes scattered irregularly, but usually more or less closely crowded in groups. Groups of thyriothecia irregularly circular, poorly defined and up to 7 mm. diam., often numerous and becoming confluent, so that the thyriothecia are more or less evenly distributed over the whole leaf surface. Thyriothecia always more densely crowded in the centre of the groups, comparatively distant and widely dispersed near the circumference, quite superficial and readily becoming detached from the leaf surface.

Single, isolated thyriothecia more or less circular in outline, 120–200 $\mu$ diam., very frequently becoming confluent in small or larger groups and then flattened laterally and obtusely angular. Basal layer flat, thin, hyaline, structure not evident. Covering membrane convex, ca. 20–25 $\mu$ high in the centre, black, carbonaceous, opaque, except near the margin, which is subopaque, snuff brown to buster, structure only evident after bleaching, formed of rather sinuously radiating hyphae, 3–4 $\mu$ thick, closely articulated, cells mostly 5–8 $\mu$ long, margin irregular or briefly subfimbriate; at first closed, finally splitting by stellate cracks into ca. 3–5 broadly triangular segments. Asci not very numerous, ca. 10–15 in each thyriothecium, broadly ellipsoid to ovate, 8-spored, sessile, 35–40 × 25–35 $\mu$, often becoming more elongated at maturity, up to 60 $\mu$ long, with a firm wall, slightly thickened (ca. 5 $\mu$) round the apex. Spores conglobate or indefinitely trichous, oblong, rounded at both ends, 1-septate, rather deeply constricted, snuff brown, smooth, 22–25 $\mu$ long, cells ovate, upper 12·5–14 $\mu$ long and 10–11·5 $\mu$ broad, lower 10–11·5 $\mu$ long and 7·5–10 $\mu$ broad. Paraphyses indefinitely fibrose, breaking down early to form the light brownish olive mucilaginous mass in which the asci are embedded.

On *Jasminum angulare* Vaill., on leaves, Kentani *Pegler*, 2288.

**LEMBOSINA** Theiss.

Ann. Myc. XI (1913) p. 437.

Like Lembosia, but without superficial mycelium.

**Lembosina Rawsoniae** Doidge, nov. spec.

No superficial mycelium. Thyriothecia hypophyllous, barely visible to the naked eye, scattered irregularly; sometimes 2-4 individual thyriothecia which are in close proximity to one another become confluent, fuse at the ends and form compound ascomata which are often Y-, L- or X-shaped. Individual thyriothecia oblong or linear, tapering slightly to rounded ends, 200-400 $\mu$ long, 80-100 $\mu$ broad, most frequently 250-300 $\mu$ long, straight or slightly curved. Basal layer subhyaline, without definite structure. Covering membrane slightly convex, at first snuff brown, becoming darker, almost black and opaque in the centre, formed of slightly undulating, radiating hyphae, 1-1·5 $\mu$ thick, with cells 1·5-2·5 $\mu$ long, becoming pellucid and gradually paler near the margin, and fading into a short, indefinite hyaline zone; margin irregular but not fringed; at maturity dehiscing by an irregular longitudinal fissure running almost the length of the covering membrane. Asci numerous, ovate or clavate-oblong, broadly rounded above, sessile or with a short, peg-like foot, 8-spored, ca. 15-20 × 7-10 $\mu$. Spores subdistichous or conglobate, oblong or subclavate broadly rounded above, tapering more or less downwards, 1-septate, not constricted at the septum or barely so, at first hyaline, becoming deep olive buff, smooth, 7-10 × 2·5-3 $\mu$; upper cell somewhat broader than the lower.

On *Rawsonia lucida* Harv. et Sond., on leaves, Hlinza Forest, Eshowe, *Gerstner*, 32662.

Very few mature spores were seen, although abundant material was examined; in mature thyriothecia, asci were either old and empty or immature, both conditions being found in the same thyriothecium; a few mature spores were found lying free in the thyriothecium.

**TRICHASTERINA** Arnaud.

Ann. de l'École Nat. d'Agric. de Montpellier,
nouv. sér. 16 (1918) p. 172.

Thyriothecia and mycelium similar to those of Asterina, but mycelium furnished with setae.

**Trichasterina Popowiae** Doidge, nov. nom.

Syn: *Englerulaster Popowiae* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 243, 279.
*Englera Popowiae* (Doidge) Stev., in Steven and Ryan, The Microthyriaceae (1939) p. 45. [Plate IV.].

Colonies epiphyllous, scattered, thin, greyish black, more or less circular in outline, up to 7 mm. diam., occasionally numerous and confluent.

Mycelium radiating, becoming loosely reticulate. Hyphae at first isabella colour, becoming light brownish olive to brownish olive, 5-6·5 $\mu$ thick, straight or nearly so, rather obscurely septate; cells 20-35 $\mu$ long; branching irregular. Hyphopodia fairly numerous, alternate, unilateral or opposite, often very irregularly placed, 1-celled, erect, curved or bent, variable in form, cylindrical, ovate or subglobose, occasionally dilated suddenly near the base, rarely 2-celled, with a short, cylindrical basal cell, mostly 10-15 $\mu$ long, rarely longer, 6-10 $\mu$ broad. Mycelial setae fairly numerous, scattered, simple, straight, brownish olive, obscurely septate, becoming subopaque, up to 350 $\mu$ long, 5-6 $\mu$ thick at the base, tapering gradually to a blunt apex, which is 1·5-2 $\mu$ thick.

Thyriothecia numerous, scattered, usually discrete, but occasionally becoming confluent in small groups, 150-190 $\mu$ diam. Basal layer subhyaline, structure not evident. Covering membrane convex, at first light brownish olive, becoming darker and subopaque in the centre, formed of rather loosely compacted, irregularly radiating hyphae ca. 5 $\mu$ thick; margin coarsely and rather sparsely fimbriate; at maturity dehiscing by irregular fissures, which at first may be more or less radiating, the central cells finally falling away and exposing the developing asci. Asci 8-spored, ovate or subglobose, 40-47 × 30-40 $\mu$. Spores conglobate, oblong, brownish olive, broadly rounded at both ends, 1-septate, constricted, minutely verruculose at maturity, 21-27 × 10-13 $\mu$, cells subglobose, equal, or the upper slightly broader.

On *Popowia caffra* (Sond.) Hook. f. et Thoms, on leaves, Buccleuch near Cramond, *Doidge*, 9714 (Type); East London, *Doidge*, 10917; Stella Bush, Durban, *van der Byl 322, 541*, 11364, 32133 and *Schilz*, 14704; Bluff, Durban, *Morgan and Doidge*, 32166; Winter's Kloof, *Doidge*, 12434.

The covering membrane of the thyriothecia breaks up irregularly in the centre, but the cells do not seem to dissolve with free formation of mucilage and this is not a typical Englerulaster-form. The dehiscence of the thyriothecium resembles that of *Trichasterina Styracis* (Th.) Arn., as figured by Arnaud (3, Pl. XXXIII); it also resembles this fungus in the presence of setae on the mycelium.

## ASTERINA Lév.

Ann. Sc. Nat. Sèr. 3, Bd. III (1845) p. 59.

Syn: *Dimerosporium* Fuckel (1869) in Symb. Myc. p. 89.
*Myxasterina* v. Höhn. (1909) in Fragm. Myk. No. 33.
*Englerulaster* v. Höhn. (1910) in Fragm. Myk. No. 520; *cf.* Theissen in Broteria (1914) p. 78.
*Parasterina* Theiss. et Syd. (1917) Ann. Myc. 15, p. 246.

Superficial mycelium usually well developed, with hyphopodia. Thyriothecia round, scutate, dimidiate; covering membrane radial, dehiscing by radiating cracks, or central part becoming mucilaginous and falling away. Hypothecium flat or slightly concave, colourless. Basal membrane present or absent. Hymenium simple, polyascous. Asci ovate to clavate, with or without typical paraphyses. Spores brown, 2-celled.

### KEY TO SECTIONS.

A.—Typical paraphyses present; they are persistent filamentous, often subclavate at the tips..... *PARASTERINA* (Species 1–5)

B.—No typical paraphyses; paraphysoids sparse, or more or less freely developed, disappearing early or sub-persistent.
(*a*) Covering membrane of thyriothecium becoming strongly convex at maturity, cells dissolved with free formation of mucilage..... *ENGLERULASTER.* (Species 8–9)
(*b*) Covering membrane usually slightly convex, dehiscing by radiating stellate cracks.
1. Basal layer of thyriothecium subhyaline, without definite structure, not membranous..... *DIMEROSPORIUM.* (Species 10–37)
2. Thyriothecia with pale fuscous or greyish basal membrane, radiating in structure..... *CLYPEOLASTER.* (Species 38–53)

### KEY TO SOUTH AFRICAN SPECIES OF ASTERINA.

I.—Typical paraphyses present.....Section *PARASTERINA.*
A.—Hyphopodia 2-celled; spores zoned..... 1. *A. pemphidiodes.*
B.—Hyphopodia 1-celled; spores not zoned.
(*a*) Spores smooth.
1. Hyphopodia very numerous, mostly opposite..... 2. *A. Oncinotidis.*
2. Hyphopodia less numerous, alternate.
x. Hyphae fringing thyriothecium tortuous..... 3. *A. Zeyheri.*
xx. Hyphae fringing thyriothecia straight or slightly undulating.
o. Spores 30–34 × 12·5–15·5 μ..... 4. *A. natalitia.*
oo. Spores 27–31 × 14–15 μ..... 5. *A. Oxyanthae.*
(*b*) Spores verrucose.
1. Hyphae all bearing hyphopodia..... 6. *A. Syzygii.*
2. Secondary hyphopodia without hyphopodia, paler..... 7. *A. Knysnae.*

II (*a*).—No typical paraphyses. Thyriothecium dehiscing by dissolution of cells of covering membrane.....Section *ENGLERULASTER.*
A.—Spores 23–28 × 12–15 μ..... 8. *A. nodosa.*
B.—Spores 33–39 × 17·5–20 μ..... 9. *Bottomleyae.*

II (*b*) 1.—No typical paraphyses. Thyriothecium dehiscing by stellate cracks. No basal membrane.....Section *DIMEROSPORIUM.*
A.—Hyphopodia continuous.
(*a*) Hyphopodia entire, or rarely sublobed.
1. Thyriothecia intercalary in origin.
x. Spores smooth.
o. Hyphopodia few, distant.
(i) Hyphopodia briefly cylindrical to subglobose..... 10. *A. secamonicola.*
(ii) Hyphopodia subglobose or conical..... 11. *A. inconspicua.*
(iii) Hyphopodia flattened hemispherical or ampulliform.
/ Hyphopodia 3·5–4 μ long; spores 9–10 μ broad 12. *A. dissiliens.*
// Hyphopodia up to 10 μ long; spores 11–11·5 μ broad..... 12*a*. *A. dissiliens*, var. *senegalensis.*

oo. Hyphopodia fairly numerous.
(i) Spores 35–42·5 μ long..... 13. *A. robusta.*
(ii) Spores 25–29 μ long.
/ Hyphae 5–7 μ thick; hyphopodia broadly cylindrical..... 14. *A. opaca.*
// Hyphae 3·5–5 μ thick; hyphopodia pyriform.. 15. *A. Vepridis.*
(iii) Spores 20–25 μ long.
/ Spores 12·5–15 μ broad..... 16. *A. Hendersoni.*
// Spores 10–12·5 μ broad.
' Hyphopodia subglobose to briefly cylindrical.
y. Immature spores not zoned..... 17. *A. ferruginosa.*
yy. Immature spores zoned..... 18. *A. Bosmanae.*
'' Hyphopodia usually sublobed, irregular, often curved.
y. Hyphae 3–3·5 μ thick..... 19. *A. delicata.*
yy. Hyphae 3·5–4·5 μ thick..... 20*a*. *A. Grewiae*, var. *zonata.*
''' Hyphopodia usually finger- or flask-shaped. 20. *A. Grewiae.*

xx. Spores verruculose.
o. Spores 16–20 × 7·5–11 μ..... 21. *A. crotoniensis.*
oo. Spores 24–29 × 13–15 μ..... 22. *A. Trichiliae.*

2. Thyriothecia terminal on short hyphal branches.
x. Spores verruculose..... 23. *A. Trichocladi.*
xx. Spores smooth, zoned..... 24. *A. raripoda.*

(*b*) Hyphopodia lobed.
1. Thyriothecia intercalary in origin.
x. Spores smooth.
o. Hyphopodia with shallow lobes or sublobed.
(i) Spores 14–16 × 8–9 μ..... 25. *A. Pavoniae.*
(ii) Spores 20–25 × 10–12·5 μ..... 20*a*. *A. Grewiae*, var. *zonata.*

2. Thyriothecia terminal on short hyphal branches.
x. Spores smooth.
o. Spores 11–13 μ long..... 26. *A. xumenensis.*
oo. Spores 13–15 μ long..... 27. *A. undulata.*
ooo. Spores 15–18 μ long..... 28. *A. Streptocarpi.*
xx. Spores verruculose..... 29. *A. gerbericola.*

B. Hyphopodia septate.
(*a*) Spores smooth.
1. Hyphopodia few, 1–5-celled..... 30. *A. woodiana.*
2. Hyphopodia fairly numerous, mostly 2-celled.
x. Spores 29–34 × 16–20 μ..... 31. *A. uncinata.*
xx. Spores 20–25 × 9–11 μ.
o. Hyphopodia 6–10 μ broad..... 32. *A. reticulata.*
oo. Hyphopodia 3–4 μ broad..... 33. *A. Scolopiae.*
xxx. Spores 17·5–20 × 8·5–11 μ..... 34. *A. Saniculae.*
(*b*) Spores punctate or minutely verruculose.
1. Spores punctate..... 35. *A. fimbriata.*
2. Spores minutely verruculose..... 36. *A. Combreti.*
(*c*) Spores grossly echinulate..... 37. *A. Peglerae.*

II (*b*) 2.—No typical paraphyses. Thyriothecia dehiscing by stellate cracks. Basal membrane present.....Section *CLYPEOLASTER.*

A.—Hyphopodia continuous.
(*a*) Hyphopodia not lobed..... 38. *A. loranthicola.*
(*b*) Hyphopodia lobed.
1. Spores smooth.
x. Thyriothecia closely crowded; spores 14–18 × 7·5–9 μ..... 39. *A. polythyria.*
xx. Thyriothecia scattered; spores 16–20 × 9–10 μ..... 40. *A. clausenicola.*
2. Spores verruculose.
x. Spores 17–25 × 10–12 μ, upper cell broader. Hyphae 3·5–5 μ thick..... 41. *A. erysiphoides.*
xx. Spores 17–20 × 9–10 μ, upper cell broader. Hyphae 2·5–3·5 μ thick..... 43*a*. *A. diplocarpa*, var. *Hibisci.*
xxx. Spores 16–18 × 7·5–10 μ, cells subequal. Hyphae 3–4 μ thick 42. *A. tertia*, var. *africana.*
xxxx. Spores 15–16·5 × 7·5–9 μ, upper cell broader. Hyphae 3·5–4 μ thick..... 43. *A. diplocarpa.*
xxxxx. Spores 25–30 × 12–14 μ..... 44. *A. Excoecariae.*

B.—Hyphopodia septate.
(*a*) Spores smooth.
1. Spores 12–15 × 5–6·5 μ..... 45. *A. Fleuryae.*

2. Spores 17·5–20 × 8·5–11 μ.
x. Hyphopodia with cylindrical basal cell..... 46. *A. van der Bylii.*
xx. Hyphopodia with gibbous basal cell..... 47. *A. peraffinis.*

(*b*) Spores more or less verruculose-echinulate.
1. Spores 16–20 μ long.
x. Spores 7–9 μ broad, cells subequal..... 48. *A. radio-fissilis.*
xx. Spores 8–10 μ broad, upper cell broader.
o. Spores conspicuously verruculose-echinulate..... 49. *A. africana.*
oo. Spores minutely verruculose-echinulate..... 49*a*. *A. africana*, var. *Kiggelariae.*

2. Spores 22–30 μ long.
x. Hyphopodia cylindrical, straight.
o. Hyphopodia slender..... 50. *A. elegans.*
oo. Hyphae broadly cylindrical..... 51. *A. capparidicola.*
xx. Hyphopodia uncinate..... 52. *A. Woodii.*

(*c*) Spores grossly verrucose. Hyphopodia lobed..... 53. *A. Rinoreae.*

**1. Asterina pemphidioides** Cke.

Grevillea V (1876) p. 16 ; Theissen, Die Gattung Asterina (1913) p. 40 (cum icones).

Syn. : *Parasterina pemphidioides* (Cke.) Theiss., Ann. Myc. XV (1917) p. 246 [Plate V.]

Colonies amphigenous, mostly hypophyllous, thin, greyish black, round to irregular in outline, not sharply defined, up to 8 mm. diam., scattered or more or less crowded, often becoming confluent and covering larger, irregular areas of the leaf surface.

Mycelium loosely reticulate, meshes of network usually quadrangular or triangular. Hyphae isabella colour to light brownish olive or bister, usually straight, sometimes more or less tortuous, 5–6 μ thick, occasionally up to 7 μ ; adjacent hyphae sometimes adhere and run parallel, forming strands of 2 or 3 hyphae ; cells mostly 25–30 μ long ; branching irregular. Hyphopodia distant, not very numerous, alternate or unilateral, 1-septate, straight or somewhat curved, cylindrical or subclavate, rounded at the apex, 12–17 μ long and 5–8 μ broad ; basal cell short, usually cylindrical, rarely gibbous, 3·5–7 μ long and 5 μ broad ; terminal cell ovate or cylindrical ; 1-celled hyphopodia occasional, especially in the neighbourhood of the thyriothecia.

Thyriothecia more or less circular, occasionally broadly elliptic, 200–350 μ diam., less frequently up to 400 μ, scattered or gregarious and becoming confluent in groups of 2–4 and consequently flattened laterally by contact. Basal layer delicate, deep olive buff, formed of loosely radiating hyphae, not membranous. Covering membrane convex, bister and pellucid at the margin, becoming almost black and opaque in the centre, formed of irregularly radiating hyphae 3–5 μ thick, cells 7–10 μ long in the centre, 15–20 μ long near the margin where the hyphae become tortuous ; margin crenate or more or less fimbriate ; at maturity 3–5 radiating cracks develop, and the centre of the covering membrane later breaks away, exposing the developing asci. Asci not very numerous, ca. 10–15 in each thyriothecium, 8-spored, ovate, broadly rounded above and attenuate to the base, or broadly ellipsoid and rounded at both ends, 67·5–80 × 45–62·5 μ ; wall rather thin, thickened round the apex 5–10 μ. Paraphyses fairly numerous, hyaline, filiform, slightly exceeding the asci, 1·5–2 μ thick, slightly thickened, 3–4 μ, at the club-shaped tips and becoming conglutinate. Spores conglobate, oblong, rounded at both ends, 1-septate, slightly constricted, 32–40 μ long ; upper cell broader and more broadly rounded, 16–20 μ long and 13–14 μ broad ; lower 15–20 μ long and 11–12·5 μ broad ; maturing spores are snuff brown with darker zones at each end and at either side of the septum, they are surrounded by a thin mucilaginous envelope ca. 1 μ thick ; at maturity the spores are bister, and the zoning becomes very faint or not evident.

On *Syzygium Gerrardi* (Harv.) Hochst., Woodbush, *Doidge*, 17755, 28338 ; associated with *Asterina Syzygii*, on the same leaves.

The hyphae and spores of this fungus are more slender than described by Theissen for the species, but agree in measurements with specimens distributed by Sydow under this name and others identified by him. (Syd. Fung. exot. 270, 271 and Phil. Bur. Sci. 20924, 8378 and 23892.)

**2. Asterina Oncinotidis** Doidge nov. nom.

Syn. : *Parasterina rigida* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 246, 277 ; not *Asterina rigida* Doidge. [Plate VI.]

Colonies epiphyllous, black, more or less circular, scattered, mostly on the primary veins, up to 7 mm. diam.

Mycelium rather closely reticulate. Hyphae sayal brown to verona brown, more or less sinuous and uneven in thickness, 5–7·5 μ thick ; cells mostly 15–20 μ long ; branches usually alternate. Hyphopodia very numerous, opposite or alternate, sometimes 3 arise from one hyphal cell and are irregularly placed, when there are two to one cell they are not always exactly opposite ; 1-celled, ovate or briefly cylindrical, broadly rounded above, erect and symmetrical or oblique, often flattened through pressure of neighbouring hyphae or hyphopodia, 6–8 μ long, rarely up to 10 μ, 5–7 μ broad.

Thyriothecia crowded, circular in outline, 300–400 μ diam., often fusing laterally in groups of 2–4 and forming larger, irregular ascomata. Basal layer delicate, structure not evident. Covering membrane slightly convex, brownish black, opaque in the centre, more or less pellucid at the margin ; margin briefly fimbriate, and composed of radiating hyphae 4–5 μ thick ; dehiscing at maturity by more or less irregularly radiating cracks and by an irregular disruption of the central cells. Asci numerous, broadly ellipsoid to ovate, sessile, 60–75 × 30–40 μ, somewhat thickened round the apex. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, constricted, smooth, sayal brown, 27–33 × 13–15 μ ; upper cell somewhat larger than the lower. Paraphyses filiform, somewhat swollen at the tips, not exceeding the asci or slightly so.

On *Oncinotis inandensis* Wood and Evans, Buccleuch, Natal, *Doidge* 9722, Type ; Inanda, *Medley Wood 1009* (Type specimen of host in Natal Herbarium) 32173.

3. **Asterina Zeyheri** Doidge nov. spec. [Plate VII.]

Colonies epiphyllous, dense black, more or less circular in outline, up to 5 mm. diam.

Mycelium radiating, becoming more or less reticulate. Hyphae dresden brown to mummy brown, straight or slightly undulating, 5–6 μ thick, occasionally up to 7·5 μ thick ; cells mostly 20–30 μ long ; branches fairly numerous, irregular. Hyphopodia rather numerous, unilateral or alternate, briefly cylindrical or ovate, 7·5–15 μ long and 7·5–9 μ broad.

Thyriothecia more or less closely crowded, discrete and circular in outline, or fusing laterally in groups of 2–4 or more and forming larger compound ascomata ; single thyriothecia 250–350 μ diam. Basal layer delicate, subhyaline, structure not evident. Covering membrane convex, brownish black and opaque in the centre ; radiating hyphae visible in the rather broad, pellucid margin are paler than the mycelial hyphae, more or less tortuous, 3–5 μ thick ; margin crenate to subfimbriate, groups of hyphae running out and fusing with the mycelial hyphae ; dehiscing at maturity by irregularly stellate fissures or quite irregularly. Asci numerous, ovate or broadly ellipsoid, 8-spored, sessile, 67·5–80 × 40–45 μ, with a firm, thick wall, 1·25 μ thick, thickened round the apex (5–7·5 μ). Spores conglobate, oblong, broadly rounded at both ends, 1-septate, deeply constricted, smooth, dresden brown to mummy brown, 30–39 μ long ; cells subglobose, upper slightly larger, 15–20 μ long and 14–16 μ broad, lower 14–19 μ long and 12·5–15 μ broad. Paraphyses numerous, hyaline, filiform, exceeding the asci, about 1 μ thick.

On *Eugenia Zeyheri* Harv., on leaves, Van Staden's Pass, *Doidge* 10873 ; Howieson's Poort, near Grahamstown, *Doidge*, 12377 ; Alexandria, *Doidge*, 22357, Type.

4. **Asterina natalitia** Doidge nov. spec. [Plate VIII.]

Colonies epiphyllous, thin, greyish black, not sharply defined, round to irregular in outline, up to 5 mm. diam.

Mycelium radiating, becoming very loosely reticulate. Hyphae dark olive buff to buffy brown, straight or very slightly undulating mostly 4–5 μ thick in places up to 6 μ ; cells mostly 22–30 μ long ; branching remote irregular, sometimes opposite. Hyphopodia alternate or unilateral, occasionally opposite, fairly numerous, usually one to each hyphal cell, continuous, cylindrical, rarely ovate or irregular, mostly straight, 7·5–13 μ long, 5–6·5 μ broad.

Thyriothecia scattered or confluent in small groups of 2–4, more or less circular in outline, 200–300 μ diam. Basal layer delicate, subhyaline, structure not evident. Covering membrane convex, opaque blackish brown in the centre, pellucid and deep to dark olive buff near the fimbriate margin, formed of radiating hyphae 2·5–3 μ thick, breaking down irregularly at maturity. Asci fairly numerous, ca. 20 in each thyriothecium, 8-spored, ovate or ellipsoid, sessile, 50–65 x 35–42·5 μ, with a firm wall. Spores conglobate, buffy brown, oblong, rounded at both ends, 1-septate, rather deeply constricted, smooth 30–34 μ long ; upper cell broadly ellipsoid, 16–17·5 μ long and 12·5–15 μ broad, lower cylindrical to ovate, 15–16 μ long and 10–12·5 μ broad, separating rather readily at the septum.

Paraphyses numerous, filiform, 1·5–2·5 μ thick, hyaline or tinged chlorine yellow, exceeding the asci, slightly swollen and club-shaped at the tips, up to 5 μ thick and becoming conglutinate.

On *Eugenia natalitia* Sond., on leaves, Woodbush, *Doidge*, 17751, Type.

On *Eugenia zuluensis* Dümmer, Xumeni Forest, near Donnybrook, *Doidge*, 28958, 29837, 29899, 32235 ; Zwartkop, near Pietermaritzburg, *Doidge*, 12438, 11597 ; Krantzkloof, *Doidge*, 8984 ; Umzinto Bush, *Wager*, 32683.

Material of this fungus is scarce, although abundant collections of *Eugenia zuluensis* have been made ; colonies of the Asterina are comparatively few on these leaves, and are associated with those of several other fungi, including *Irene atra* and *Meliola cylindripoda*.

5. **Asterina Oxyanthi** Doidge nov. nom.

Syn. : *Parasterina laxa* Doidge, Bothalia I (1924) p. 201 ; not *Asterina laxa* Wint.
*Parasterina brachystoma* (Rehm.) Th. var. *laxa* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 201. [Plate IX.]

Colonies epiphyllous, black, scattered, round to irregular in outline, up to 5 mm. diam., more or less crowded and becoming confluent.

Mycelium laxly or more closely reticulate, forming a network with quadrangular or triangular meshes. Hyphae tawny olive to warm sepia, straight, 6–7·5 μ thick, or occasionally up to 8 μ thick ; cells mostly 20–23 μ long ; branches irregular, alternate or opposite. Hyphopodia fairly numerous, alternate or unilateral, 1-celled, briefly cylindrical or ovate, broadly rounded above, 7·5–9 μ long, 7·5–9 μ or occasionally up to 10 μ broad ; the majority are erect, at right angles to the hyphae.

Thyriothecia crowded, circular in outline, 250–400 μ diam., or fusing laterally in groups of 2–4 or more and forming larger, irregular, compound ascomata. Basal layer delicate, hyaline, structure not evident. Covering membrane convex, blackish brown and opaque in the centre, with a narrow pellucid margin, composed of radiating hyphae 3–4 μ thick ; structure obscure in the centre, which breaks down irregularly at maturity ; margin fimbriate. Asci numerous, 20–30 in each thyriothecium, 8-spored, ovate or broadly ellipsoid, sessile, 60–75 × 40–50 μ, with a firm, thick wall, 1–1·5 μ thick, thickened round the apex, up to 10 μ. Spores conglobate, snuff brown, oblong, broadly rounded at both ends, 1-septate, deeply constricted, smooth, 27–31 μ long ; cells subglobose, upper slightly larger, 14–15 μ long and 14–15 μ broad, lower 14–15 μ long and 12·5–14 μ broad. Paraphyses hyaline or with a yellowish tinge, numerous, filiform, 2·5–3 μ thick.

On *Oxyanthus Gerrardi* Sond., on leaves, Woodbush, *Doidge*, 1758, Type, 28326 and *van der Byl 1534* ; Berea, Durban, *van der Byl 111, 741*, 11017, 11366.

6. **Asterina Syzygii** Doidge nov. spec.

Sub *Parasterina brachystoma* (Rehm.) Th. in Trans. Roy. Soc. S. Afr. 8 (1920) p. 245. Plate X.

Colonies amphigenous, mostly epiphyllous, black, crustaceous, more or less circular in outline, usually up to 5 mm. diam., less frequently up to 10 mm.

Mycelium stout, verona brown to warm sepia, irregularly reticulate. Hyphae radiating, straight or more or less tortuous, 6–8 μ thick, closely septate ; cells 10–16 μ long, walls often oblique ; branches numerous, irregular. Hyphopodia fairly numerous, alternate or unilateral, briefly cylindrical, ovate or subglobose, 7–12·5 μ long and 7–10 μ broad, at right angles to the hyphae or more or less oblique.

Thyriothecia rather numerous, scattered or more or less crowded, not infrequently developing in irregular, concentric rings round the centre of the colony, discrete and circular in outline, crowded and becoming flattened laterally by contact, or less frequently becoming completely fused and forming larger, compound ascomata. Single thyriothecia 250–350 μ diam., rarely up to 400 μ. Basal layer subhyaline, delicate, structure not evident. Covering membrane slightly convex, almost black and opaque in the centre, tawny olive, often paler than the mycelium at the margin, firmly compacted, formed of radiating hyphae 3–5 μ thick, which are usually somewhat tortuous near the margin ; margin irregular, subfimbriate, a few hyphae, or groups of hyphae running out and fusing with the mycelial hyphae ; breaking into several triangular segments at maturity, by radiating stellate fissures. Asci numerous, more than 30 in each thyriothecium, 6–8-spored, broadly ellipsoid to ovate, sessile, 60–75 × 37·5–45 μ, with a firm, stout wall 2–2·5 μ thick, slightly thickened round the apex, 7–9 μ. Spores oblong, broadly rounded at both ends, 1-septate, very slightly

constricted, warm sepia, finely and very closely verruculose, 27·5–35 × 14–17 μ; cells equal in length, upper usually very slightly broader; roughness of the epispore visible even in immature, hyaline spores in the ascus. Paraphyses numerous, filiform, hyaline or tinged chlorine yellow, septate, 2–2·5 μ thick, swollen or clavate at the tips and 3·5–4 μ thick, slightly exceeding the asci and becoming conglutinate.

On *Syzygium Gerrardi* (Harv.) Hochst., Woodbush, *Gray*, 888, *Doidge*, 1759, 17755, Type, and 28337, *van der Byl 1514, 1523*; Buccleuch, near Cramond, Natal, *Doidge*, 9723 and *Sim*, 10141; Entabeni, N. Transvaal, *Bosman*, 26113; Winter's Kloof, Natal, *Doidge*, 12439.

This fungus, which is usually heavily parasitised, appears to be limited to *Syzygium Gerrardi*; it is closely related to *Asterina brachystoma*, but not identical with that species, from which it differs in the larger thyriothecia, verruculose spores and other details. It is associated with *Asterina pemphidioides* in No. 28337.

7. **Asterina Knysnae** Doidge nov. spec. [Plate XI.]

Colonies amphigenous, more or less circular in outline, up to 5 mm. diam., or, if on the under surface, with a tendency to become elongated along veins and leaf margins, scattered or becoming confluent, thin, greyish black, not sharply defined.

Mycelium loosely reticulate, meshes angular. Main hyphae olive brown, straight or slightly tortuous, 6–7·5 μ thick, cells mostly 25–30 μ long, branching irregular. Hyphopodia unilateral or alternate, rarely opposite, numerous, continuous, cylindrical to pyriform, erect, oblique or appressed to the hyphae, straight, curved or bent, 10–15 μ long and 8–10 μ broad. Branches or secondary hyphae paler, dark olive buff to olive brown, 3·5–5 μ thick and devoid of hyphopodia or almost so.

Thyriothecia scattered or grouped, occasionally becoming confluent, round or somewhat irregular in outline, 120–150 μ diam. Basal layer subhyaline, delicate, structure not evident. Covering membrane slightly convex, formed of radiating hyphae 2·5–4 μ thick, opaque in the centre and structure obscure, pellucid, pale olive brown near the fimbriate margin: dehiscing irregularly at maturity, the centre of the covering membrane finally falling away and leaving only the fimbriate margin; fringing hyphae 3–4 μ thick, radiating, more or less straight, deep to dark olive buff. Asci few, up to 10 in each thyriothecium, 8-spored, subglobose to ovate, sessile, 50–57·5 × 40–50 μ, with a firm thick wall, 1–1·5 μ thick, thickened round the apex, up to 7·5 μ. Spores conglobate, buffy brown to olive brown, oblong, rounded at both ends, 1-septate, constricted, minutely and closely verruculose, 30–35 μ long; cells subglobose, upper larger, 16–20 μ long and 16–17·5 μ broad, lower 14–15 μ diam. Paraphyses hyaline, filiform, 1·5–2 μ thick.

On *Canthium ciliatum* O.Kze., on leaves, Deepwalls, Knysna, *Doidge*, 17226.

8. **Asterina nodosa** Doidge nov. spec. [Plate XII.]

Colonies epiphyllous, scattered, black, more or less circular in outline, up to 5 mm. diam.

Mycelium reticulate, forming a rather open network with angular meshes. Main hyphae cinnamon brown to Prout's brown, irregularly bent and curved, often gnarled and subtorulose, 3·75–7·5 μ thick, mostly 5–6 μ thick, secondary hyphae usually paler and not more than 5 μ thick; rather closely septate, cells mostly 15–20 μ long; branching irregular. Hyphopodia fairly numerous, alternate or unilateral, continuous, very variable in form, often more or less cylindrical, rarely straight, bent or variously curved, often irregularly and obtusely sublobed, 7–12·5 μ long, 6–10 μ broad; rarely 2-celled and then up to 17·5 μ long with basal cell cylindrical or tapering downwards and ca. 10 μ long.

Thyriothecia numerous, scattered, usually discrete, occasionally confluent in small groups of 2–3, more or less circular in outline, 100–150 μ diam. Basal layer subhyaline, delicate, structure not evident. Covering membrane becoming strongly convex, blackish brown and opaque at maturity, composed of irregularly radiating hyphae, 2·5–4 μ thick, cells mostly 5–10 μ long; surrounded at the margin by a more or less ragged fringe of paler, tortuous and torulose hyphae, which are cinnamon buff to tawny, 2·5–4 μ thick; at maturity the central cells fall away, exposing the asci, which are embedded in a brownish, mucilaginous mass, radiating cracks develop towards the margin. Asci not very numerous, 8-spored, subglobose to broadly ovate, broadly rounded above, sessile, 37–45 × 35–40 μ; wall rather delicate, readily rupturing and setting the spores free. Spores conglobate, oblong, broadly rounded at both ends, almost equally 1-septate, rather deeply constricted, snuff brown to cinnamon brown, finely and rather remotely verruculose-echinulate, 23–28 μ long; cells subglobose, upper 12–15 μ, lower 11–12·5 μ broad.

On *Ilex mitis* (L.) Radlk., Woodville Forest, George, *Doidge*, 10943.

This fungus is related to *Englerulaster orbicularis* (B. et C.) v. Höhn., to which it is similar in habit, but from which it differs in the size of the spores. It is associated with *Asterina Hendersoni* and *A. Bottomleyae* on the same leaves, and a few colonies have been observed in other collections of these fungi on *Ilex mitis*.

9. **Asterina Bottomleyae** Doidge nov. spec. [Plate XIII.]

Colonies amphigenous, mostly epiphyllous, numerous, scattered, dense black, more or less circular, up to 5 mm. diam.; often very numerous and covering a large part of the upper surface of the leaf.

Mycelium radiating. Hyphae straight or slightly sinuous, buckthorn brown to dresden brown, 6·5–7·5 μ thick, closely septate, cells 15–25 μ long; branches usually opposite and emerging at an angle of about 45°. Hyphopodia numerous, mostly opposite, in places unilateral or alternate, mostly erect and almost at right angles to the hyphae, briefly cylindrical and broadly rounded above, or more or less pyriform and narrowing rather suddenly near the apex, continuous, 10–14 μ long and 6·5–7·5 μ broad.

Thyriothecia very numerous, more or less circular in outline, 120–160 μ or up to 200 μ diam.; often closely crowded and in many cases forming an irregular circle round the centre of the colony. Basal layer subhyaline, delicate, structure not evident. Covering membrane at first buckthorn brown, slightly convex, pellucid, becoming strongly convex and opaque black as it approaches maturity, composed of radiating hyphae, which, near the margin are more or less tortuous and ca. 5 μ thick; the margin is more or less fimbriate, with a fringe of paler tortuous hyphae, but when the thyriothecia are mature, this is more or less concealed by the swollen central portion which has become subglobose; walls of the central cells dissolving at maturity, completely disappearing and exposing the asci. Asci not very numerous, up to 10 in each thyriothecium, 4–8-spored, ovate to subglobose, sessile, 65–80 × 58–60 μ, with a firm wall slightly thickened round the apex. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, deeply constricted, at first hyaline to buckthorn brown and smooth, when quite mature, dresden brown, minutely and closely verruculose, 33–39 μ long; cells subglobose, upper 17·5–20 μ diam., lower 15–19 μ.

On *Ilex mitis* (L.) Radlk., on leaves, Mont-aux-Sources, Natal, *Bottomley*, 23406, Type; Woodbush, *Doidge*, 1753, 17780; Brander's High Forest, Victoria East, *van der Byl*, 9461; Buccleuch, Natal, *Doidge*, 11563; Woodville Forest, George, *Doidge*, 10943a; Klein Kruis Rivier, Riversdale, *Muir 3452*, 32375; between Vryheid and Nongomo, *Pole Evans*, 32373; Graskop, *Galpin*, 32370; Knysna, *Laughton*, 32468.

This fungus is often associated with *Asterina Hendersoni*, which occurs on the same leaves.

10. **Asterina secamonicola** Doidge.

Bothalia II (1927) p. 233. [Plate XIV.]

Colonies epiphyllous, thin, greyish black, more or less circular in outline, up to 6 mm. diam.; often numerous, becoming confluent and covering the greater part of the leaf surface.

Mycelium closely reticulate, meshes of network angular. Hyphae isabella colour, 3·5–4 μ thick, straight or slightly sinuous, rather closely septate, cells mostly 15–20 μ long; branching very freely and irregularly, especially in the vicinity of the hyphopodia and early producing a close network. Hyphopodia not at all numerous, usually only on the main hyphae and not readily distinguishable in the older parts of the mycelium; usually distant, solitary, unilateral or alternate, occasionally two develop on the same side of the hypha from the same cell; hyphopodia continuous, very briefly cylindrical, subglobose or flattened obliquely, somewhat darker than the hyphae, 6·5–12 μ long, 6·5–8 μ broad, rarely up to 10 μ broad.

Thyriothecia numerous, scattered, more or less circular in outline, 180–240 μ diam., usually discrete, occasionally becoming confluent. Basal layer hyaline, delicate, structure not evident. Covering membrane slightly convex, at first isabella colour, rapidly becoming darker, subopaque, firmly compacted and formed of radiating hyphae 3–3·5 μ thick; pellucid near the margin, which is entire or briefly fimbriate; at first closed, splitting at maturity, through stellate fissures, into a few broad, triangular segments, central cells later breaking down irregularly. Asci rather numerous, 20–30 in each thyriothecium, 8-spored, subglobose, broadly rounded above, sessile, 30–32 × 27–30 μ or oblong-ovate, 40–50 × 24–27 μ; with a firm, thick wall, which is slightly thickened, up to 5 μ, round the apex. Spores conglobate, oblong, rounded at both ends, 1-septate, constricted, snuff

brown, smooth, 20–23·5 μ long; cells oval, upper 9–10 μ broad, lower 6·5–7·5 μ broad. Paraphysoids hyaline, filamentous, breaking down early and producing the yellowish-brown, mucilaginous mass in which the asci are embedded.

On *Secamone alpini* Schultes, on leaves, Woodbush, *Doidge*, 17716.

**11. Asterina inconspicua** Doidge nov. comb.

Syn.: *Asteromyxa inconspicua* Doidge, Bothalia I (1924) 199. [Plate XV.]

Colonies epiphyllous, scattered, minute, thin, inconspicuous, brownish black, round to irregular in outline.

Mycelium radiating, main hyphae often running closely parallel and forming strands of 2–4 hyphae; becoming loosely reticulate. Hyphae dark olive buff to buffy brown, mostly 2·5–4 μ thick, in places up to 5 μ, almost straight or more or less undulating; cells mostly 20–25 μ long; branching irregular. Hyphopodia few, distant, hemispherical to conoid, sometimes broader than long, 5–9·5 μ long, 5–7·5 μ broad, somewhat darker than the hyphae.

Thyriothecia fairly numerous; there is usually a group of 2–5 closely crowded in the centre of the colony, elsewhere they are scattered; single thyriothecia more or less circular in outline or becoming angular through lateral pressure, 150–200 μ diam. Basal layer hyaline, inconspicuous. Covering membrane slightly convex, buffy brown, becoming almost black and quite opaque, formed of somewhat undulating, radiating hyphae 2·5–4 μ thick, cells mostly 4–5 μ long, margin somewhat irregular but not fimbriate; at maturity developing more or less radiating or irregular cracks, the central cells finally falling apart and disappearing. Asci 8-spored, at first ovate or oblong-ovate, 30–35 × 22–24 μ, when mature often becoming more elongated; disappearing early and leaving groups of spores embedded in dirty brown, mucilaginous matter, probably formed through the early break-down of paraphysoids. Spores conglobate, oblong, rounded at both ends, 1-septate, rather deeply constricted, dark olive buff, smooth, 17–22 μ long; upper cell larger, 10–13 μ long and 8–8·5 μ broad, lower 8–9 μ long and 6·5–8 μ broad.

On *Chilianthus arboreus* A DC., on leaves, Van Staden's Pass, *Doidge*, 17252, Type; Belmont Valley, Grahamstown, *Britten*, 22342.

This species is closely related to *Asterina dissiliens*, *A. secamonicola*, *Lembosia piriensis* and *L. durbana*. The five fungi seem to form a natural group, although the two Lembosia spp. differ in the shape of the thyriothecia. They are similar in habit, have few and distant hyphopodia, a tendency to mucilage formation and dissolution of central cells of the covering membrane (in this approaching Englerulaster and Asteromyxa) and spores of similar form which germinate in the region of the septum.

At the tips of hyphal branches, especially in the younger parts of the colony, ellipsoid or ovoid swellings are sometimes observed; these are non-septate. These bodies were called conidia in the original description (Doidge l.c.) but this is apparently incorrect. Similar bodies are to be found on the mycelium of *Asterina dissiliens* and *A. secamonicola*.

**12. Asterina dissiliens** (Syd.) Doidge nov. comb.

Syn: *Parasterina reticulata* Doidge, Bothalia I (1924) p. 200, not *Asterina reticulata* (Kalch. et Cke.) Doidge.

*Asterinella dissiliens* Syd., Ann. Myc. 22 (1924) p. 425. [Plate XVI.]

Colonies amphigenous, chiefly epiphyllous, thin, greyish black, more or less circular in outline, 4–10 mm. diam.: frequently numerous, especially on the upper side, becoming confluent and covering a large part of the leaf surface.

Mycelium more or less closely reticulate; meshes of network usually irregularly quadrilateral or triangular. Primary hyphae isabella colour, straight or more or less undulating, usually radiating from the centre of the colony like the spokes of a wheel, 3–4 μ thick, cells mostly 15–25 μ long, branching freely and irregularly; hyphal branches, early forming a more or less close network between the main hyphae, are somewhat paler. Hyphopodia not very numerous, only on the main hyphae, unilateral or alternate, usually distant, continuous, flattened hemispherical or prostrate ampulliform, occasionally sublobed, usually broader than long, rarely suberect, usually 3·5–4 μ long and 8–13 μ broad, somewhat darker than the hyphae.

Thyriothecia numerous, scattered, often rather crowded near the centre of the colony and occasionally confluent, circular in outline, 120–250 μ diam. Basal layer delicate, hyaline, structure not evident. Covering membrane slightly convex, opaque and blackish brown in

the centre, pellucid at the fimbriate margin ; fringing hyphae ca. 3 $\mu$ thick, fusing with the mycelial network ; at first closed, then breaking into a few triangular segments through the formation of stellate fissures, the central part finally falling away and exposing the asci. Asci numerous, 8-spored, at first ovate or oblong-ovate, 40–55 × 25–35 $\mu$, at maturity often becoming more elongated, cylindrical or clavate, and then up to 75 $\mu$ long and 18–22 $\mu$ broad, sessile, slightly thickened round the apex. Spores conglobate in the ovate asci, obliquely monostichous or distichous in the elongated asci, snuff brown, ellipsoid, rounded at both ends, 1-septate, deeply constricted, 20–25 $\mu$ long ; cells ovate or subglobose, upper usually larger, 11–13·5 $\mu$ long and 9–10 $\mu$ broad, lower 10–11·5 $\mu$ long and 7·5–9 $\mu$ broad ; germinating near the septum. Paraphysoids filiform, numerous, subpersistent, finally breaking down into the yellowish brown mucilaginous mass in which the asci are embedded.

On *Cassine papillosa* O. Kze., on leaves, Knysna, *van der Byl 1361*, Type ; Kentani, *Pegler*, 2253 ; Woodville Forest, George, *Doidge*, 10941 ; Deepwalls, Knysna, *J. Phillips*, (*van der Byl 2220*), 20383.

*Gymnosporia buxifolia* Szysz., near Durban, *Medley Wood 6452*, 337, 9500, 9518 ; East London, *Doidge*, 10913 ; Empangeni, *van der Byl*, 11367 ; Alexandria, *Doidge*, 22404 ; Knysna, *Bottomley*, 31014, 32115, 32242 ; Umhlanga Rocks, *Wager 56*, 32 82 ; Zululand, *van der Byl 321* ; Groot Rivier, Knysna, *van der Byl 2296* ; East London, *Bartel* (*van der Byl 2430*).

*Gymnosporia harveyana* Loesen. Claridge, Natal, Doidge, 8997 ; Woodbush, *Doidge* 17751.

*Gymnosporia nemorosa* E. & Z., Knysna, *Pienaar*, 2429 ; Umgeni, near Durban, *Medley Wood*, 9023 ; Kentani, *Pegler 2336*, 9069 ; Port Elizabeth, *Bottomley*, 9558 ; Lovedale Institute, Alice, *Doidge*, 10974 ; Langholm Estates, Bathurst, *Doidge*, 12370 ; Howieson's Poort, Grahamstown, *Doidge*, 12386 ; van Staden's Pass, *Doidge*, 17262 ; Empangeni, *McClean*, 31077 ; Knysna, *van der Byl 2304*.

*Gymnosporia* sp., Groot Rivier, Knysna, *van der Byl 1392*.

*Pleurostylia capensis* Oliv., Kentani, *Pegler*, 2532.

*Putterlickia pyracantha* Endl., Amanzi, near Uitenhage, *Doidge*, 22406.

*Putterlickia verrucosa* Szysz., Kentani, *Pegler*, 8782 ; Winkle Spruit, *Doidge*, 9007 ; Umgeni, near Durban, *Medley Wood*, 9033 ; Pirie Forest, Kingwilliamstown, *Doidge*, 12286, 12330 ; East London, *Doidge*, 12407 ; Alexandria, *Doidge*, 22405.

*Asterinella dissiliens* Syd. is the same fungus as that described as *Parasterina reticulata* ; the type collection, *van der Byl 1361*, is identical with collections on Celastraceae made elsewhere. Hyphopodia are present on the mycelium of the type, but are few and inconspicuous. The type is on *Cassine papillosa*, not *Cassine croceum* (= *Eleaodendron croceum*) as originally stated.

An unfortunate error was made in indicating No. 11725 on *Gymnosporia senegalensis* as the type specimen of *Parasterina reticulata* (Doidge, loc. cit.). The original description and drawing were made from No. 9069 on *Gymnosporia nemorosa*, which must be regarded as the type. The two collections on *G. senegalensis* vary decidedly from the type and are regarded as a distinct variety.

*Asterina dissiliens* is a very common and widespread species on a number of plants belonging to the family Celastraceae ; it should not be confused with *Asterina reticulata* (K. & Cke.) Doidge, which occurs on Oliniaceae and has 2-celled hyphopodia. (*See* Stevens and Ryan, 32, p. 64.)

12a. **Asterina dissiliens** (Syd.) Doidge, var. **senegalensis** Doidge nov. var.

Mycelium closely reticulate, formed of strongly undulating hyphae 4–5 $\mu$ thick ; hyphopodia hemispherical to ovate or ampulliform, more frequently erect than in the type, up to 10 $\mu$ long and 10 $\mu$ broad. Spores oblong, 1-septate, deeply constricted, 20–23·5 $\mu$ long ; cells subglobose or ovate, upper 11–11·5 $\mu$ diam., lower 9–10 $\mu$.

On *Gymnosporia senegalensis* Loes., on leaves, Nelspruit, *van der Byl*, 7076 ; Rikatli, Mozambique, *Junod*, 11725 ; Nelspruit, *Liebenberg*, 29907 ; Sabie, *Wager*, 32413.

13. **Asterina robusta** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 256, 277.

Syn. : *Parasterina implicata* Doidge, loc. cit., pp. 244, 275. [Plate XVII.]

Colonies mostly epiphyllous, a few occasionally on the under side of the leaf, round to irregular in outline, black, crustaceous, 3–5 mm. diam., often numerous and confluent ; leaf tissues under the fungus sometimes discoloured to a light brown.

Mycelium radiating, becoming loosely or closely reticulate, meshes of network mostly angular. Hyphae ochraceous tawny to cinnamon brown, straight or more or less tortuous, variable in thickness, somewhat torulose in places, 5–7 μ thick, sometimes up to 9 or 10 μ thick, briefly articulate, cells 14–25 μ long; branches very numerous, irregular, often opposite, usually somewhat narrowed at the junction with the main hyphae, tips of branches often somewhat club-shaped. Hyphopodia not very numerous, unilateral or alternate, 1-celled, hemispherical, briefly cylindrical, ovate or slightly flattened, 6–10 μ long, 6·5–7 μ or up to 10 μ broad.

Thyriothecia usually crowded near the centre of the colony, round, 300–400 μ diam., often fused in small groups of 2–4 or more, thus forming larger, irregular, compound ascomata. Basal layer delicate, subhyaline, structure not evident. Covering membrane convex, opaque, cinnamon brown to almost black in the centre, clay colour to ochraceous tawny and pellucid near the margin, very firmly compacted, composed of radiating, somewhat undulating hyphae, 3·5–5 μ thick; cells 15–25 μ long near the margin, septation in the centre not readily discernible; margin not fimbriate, but radiating hyphae composing the covering membrane often fuse at the margin with the mycelial network; rupturing at maturity into a number of trianguiar segments by radiating stellate cracks, or breaking down irregularly. Asci numerous, ca. 20 in each thyriothecium, ovate to subglobose, broadly rounded above, sessile, 8-spored, with a firm, thick wall, 62–82·5 × 50–70 μ. Paraphysoids numerous, at first hyaline, rather stout, 2–4 μ thick, septate, more or less tortuous or torulose, subpersistent; becoming tinged pale olive yellow as the asci approach maturity and finally breaking down into a dirty yellow or ochraceous mucilaginous mass. Spores conglobate, cinnamon brown, ellipsoid-oblong, broadly rounded at both ends, 1-septate, rather deeply constricted, smooth, 35–42·5 × 17–20 μ; cells ovoid to subglobose, equal, or the upper slightly broader.

On *Sideroxylon inerme* L., on leaves, Mossel Bay, *Pole Evans*, 9066, Type; East London, *Doidge*, 10922 (Type of *Parasterina implicata*); Langholm Estates, Bathurst, *Doidge*, 12357; Kowie, *Britten*, 14221.

*Parasterina implicata* was described from material not fully mature, and the host was wrongly identified; there can be no doubt that it is the same fungus as *Asterina robusta*.

14. **Asterina opaca** Syd.

Ann. Myc. 10 (1912) p. 3; Theiss., Die Gattung Asterina (1913) p. 113; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 255. [Plate XVIII.]

Colonies epiphyllous, round, dense black, 1–3 mm. diam., scattered.

Mycelium more or less closely reticulate, stout. Hyphae straight, snuff brown to bister, 5–7 μ thick, thick-walled, walls ca. 1 μ thick; cells mostly 10–15 μ long; branches numerous, usually alternate. Hyphopodia numerous, opposite or alternate, 1-celled, briefly cylindrical or subpyriform, broadly rounded at the apex or more or less attenuate, 8–11 μ long, 5–6 μ broad.

Thyriothecia often only 1 or 2 in each colony, but as many as 10 in the larger colonies, round, 150–250 μ diam. Basal layer subhyaline, delicate, structure not evident. Covering membrane convex, opaque, bister to black, structure only evident after prolonged exposure to the action of a bleaching agent, composed of irregularly radiating hyphae, mostly 4–5 μ thick but in places up to 7·5 μ thick; central cells 5–7·5 μ long, those near the margin 20–25 μ long; somewhat fimbriate at the margin, fringing hyphae straight or nearly so, at times somewhat torulose, rigid, snuff brown, 4–5 μ thick and up to ca. 50 μ long; dehiscing by irregularly radiating fissures. Asci numerous, ovate to globose, 8-spored, with a firm wall somewhat thickened at the apex, 50–70 × 35–46 μ, embedded in a mass of ochraceous, mucilaginous matter. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, deeply constricted, bister, smooth, 26–28 × 13–14 μ; cells equal, or the upper slightly broader.

On *Chrysophyllum natalensis* Sond., Amanzimtoti, Natal, *Doidge*, 1664, Type; Buccleuch, Natal, *Doidge*, 11555.

15. **Asterina Vepridis** Doidge nov. spec. [Plate XIX.]

Colonies amphigenous, thin, greyish black, effuse, not sharply defined, more or less circular and up to 3 mm. diam., or spreading somewhat along the veins and leaf margins.

Mycelium loosely reticulate, network with angular meshes. Hyphae radiating, tawny olive to snuff brown, straight or nearly so, 3·5–5 μ thick, cells mostly 15–20 μ long; branches rather distant, usually opposite and emerging at an angle of about 45° with the main hyphae.

Hyphopodia numerous, opposite, alternate or unilateral, 1-celled, pyriform or flask-shaped, straight, slightly curved or gibbous, 7·5–11 μ long, 4-5 μ thick at the base, tapering more or less gradually into a short neck.

Thyriothecia numerous, crowded in the centre of the colony, rarely scattered, frequently fused in groups of 2–4 or many and forming large or small, irregular, compound ascomata. Single thyriothecia round, 160-200 μ diam. Basal layer delicate, hyaline, structure not evident. Covering membrane convex, snuff brown, becoming opaque in the centre, formed of straight, radiating hyphae 3–4 μ thick; central cell almost cubical, 3–5 μ long, up to 8 μ long near the margin, which is avellanous and briefly fimbriate; at maturity, splitting into several triangular segments through radiating stellate cracks. Asci not very numerous, about 10 in each thyriothecium, 8-spored, subglobose to ovate, sessile, with a thick, firm wall, 50–52·5 × 45–47·5 μ. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, constricted, snuff brown, smooth, 25–29 μ long; cells subglobose to ovate, upper larger, 15–16 μ long and 14–15 μ broad, lower 11–14 μ long and 11–12·5 μ broad.

On *Vepris lanceolata* Don., Xumeni Forest, near Donnybrook, *Doidge*, 27742.

16. **Asterina Hendersoni** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 255, 275. [Plate XX.]

Colonies amphigenous, black, irregularly circular in outline, mostly up to 3 mm. diam., occasionally up to 5 mm., scattered, sometimes numerous and becoming confluent.

Mycelium very variable in habit, at first loosely reticulate; with primary hyphae almost straight, forming angular meshes, or irregularly undulating and forming rounded meshes; frequently the spaces between the primary hyphae become completely filled with paler secondary hyphae and hyphopodia, thus forming a very close network, especially in the neighbourhood of the thyriothecia.

Hyphae dark olive buff to olive brown, 5–6 μ thick, very variable; sometimes almost straight to slightly undulating, not varying in width, sometimes more deeply and irregularly undulating, more or less tortuous and often subtorulose; both forms are often found on the same leaves. Hyphae closely septate, cells often 6–8 μ long, or up to 15 μ long; branches numerous, often opposite. Hyphopodia very numerous, unilateral or opposite, rarely opposite, hemispherical, very briefly cylindrical or obliquely flattened, mostly 5–7·5 μ long and 5–6 μ broad.

Thyriothecia numerous, scattered or somewhat crowded, more or less circular in outline, 150–200 μ diam. Basal layer delicate, subhyaline, structure not evident. Covering membrane slightly convex, at first dark olive buff, becoming blackish brown and opaque or subopaque, formed of rather loosely compacted, irregularly radiating hyphae about 3·5 μ thick; cells mostly 5–6 μ long; margin not fimbriate or rather sparsely so with fringing hyphae tortuous, 3–5 μ thick; at maturity developing irregularly radiating cracks, and central cells early falling away. Asci 8-spored, broadly ellipsoid to ovate, sessile or subsessile, 45 50 × 26–33 μ. Spores conglobate, oblong to narrow ovate, broadly rounded at both ends, 1-septate, deeply constricted, buffy brown, smooth, rather thin-walled; cells subglobose, upper definitely larger, 11–15 μ long and 12·5–15 μ broad, lower 10–12·5 μ long and 10–12 μ broad. Paraphysoids fairly well developed, indistinctly fibrose, breaking down early.

Pycnidia numerous, similar to the thyriothecia but smaller, 120–150 μ diam. Conidia very variable in form and size, ovate, pyriform, ellipsoid or oblong, 20–30 × 10–15 μ, buffy brown with a distinct hyaline, medial band.

On *Ilex mitis* (L.) Radlk. (=*Ilex capensis* Sond. & Harv.) on leaves, Hog's Back, Alice, *J. & M. Henderson* 11341, 11342, Type; Hog's Back, *Rattray*, 32372; Brander's High Forest, Victoria East, *van der Byl*, 9461; van Staden's Pass, *Pole Evans*, 11443 and *Doidge*, 10884; Woodville Forest, George, *Doidge*, 10943 and *Ballenden*, 3247f; Storm's River, Humansdorp Distr., Doidge, 17187; Assegai Bush, *Doidge*, 17242; Alexandria, *Doidge*, 22418; Deepwalls, Knysna, *Doidge*, 17210; Caradoc's Bush, Knysna, *Bottomley*, 32119; Bracken Hill, Knysna, *van der Byl 2314*; Knysna, *van der Byl 2289*, *2266* and *Laughton*, 32469; Keiskama Hoek, *Stayner 75*, 32377; Jonkershoek, Stellenbosch, *van der Byl 2199*; Zwartkop near Maritzburg, *T. R. Sim*, 10574; Buccleuch near Cramond, *Doidge*, 11563; Woodbush, *Doidge*, 1753, *Puttevill*, 32470 and *van der Byl 1516*; Duivelskantoor, Kaapschehoop, *Pole Evans*, 32376; Ncaga Mt., Luneberg, *Galpin 9869*, 32374.

This fungus occurs very commonly on *Ilex mitis*, in several collections being associated on the same leaves with *Asterina Bottomleyae* and in No. 10943 with *A. nodosa*. Although

the thyriothecium dehisces by an extensive break-down of the central part of the covering membrane, it does not seem to form quantities of mucilage, nor is the covering membrane strongly convex at maturity ; it is not a typical Englerulaster form, and must be regarded as a transition form between the typical Englerulaster and Asterina proper. In habit it closely resembles *Englerulaster continuus* Syd., which also occurs on *Ilex*, but the latter is a much stouter species, with deeply and fairly regularly undulating hyphae.

17. **Asterina ferruginosa** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) p. 254. [Plate XXI.]

Colonies epiphyllous, scattered, more or less circular, up to 8 mm. diam., thin, black, frequently coalescing and forming larger, irregular, compound colonies.

Mycelium rather closely reticulate, especially in the neighbourhood of the thyriothecia. Hyphae old gold to isabella colour, slightly undulating, 3·5–5 $\mu$ thick ; parallel hyphae sometimes fuse and form thicker, radiating strands ; cells mostly 20–27 $\mu$ long ; branches numerous, irregular, often opposite. Hyphopodia alternate or unilateral, fairly numerous, usually 1-celled, subglobose, obovate or briefly cylindrical, rarely hemispherical. 6–10 $\mu$ long, 7·5–9 $\mu$ broad ; 2-celled hyphopodia occasional, especially in the neighbourhood of the thyriothecia, 12·5–19 $\mu$ long, with a cylindrical basal cell 6–9 $\mu$ long, and terminal cell 6–9 $\mu$ broad, similar in form to the 1-celled hyphopodia.

Thyriothecia numerous, scattered or crowded, rarely remaining discrete, usually fusing in groups of 2–4 or more and forming larger, irregular, compound ascomata ; single thyriothecia circular or somewhat oval in outline or flattened by lateral contact, 160–200 $\mu$ diam. Basal layer delicate, subhyaline, without recognisable structure. Covering membrane convex, at first pellucid, ochraceous tawny to isabella colour, becoming darker and opaque in the centre ; composed of radiating hyphae 3–3·5 $\mu$ thick, central cells almost cubical, 3–5 $\mu$ long, marginal cells slightly longer, 5–8 $\mu$ long ; margin copiously fimbriate, fringing hyphae paler, 2·5–3·5 $\mu$ thick, tortuous, septate ; splitting at maturity into a number of narrow, triangular segments by means of radiating, stellate fissures. Asci fairly numerous, ca. 15 in each thyriothecium, 8-spored, subglobose to ovate, broadly rounded above, sessile, 35–45 × 30–37·5 $\mu$, embedded in a mucilaginous mass which is honey yellow to yellow ochre in colour. Spores conglobate, oblong, rounded at both ends, 1-septate, constricted, isabella colour, smooth, 23–26 $\mu$ long ; upper cell larger, subglobose to ellipsoid, 12–14 $\mu$ long and 11–12·5 $\mu$ broad, lower ellipsoid, 11–12·5 $\mu$ long and 10–11 $\mu$ broad.

On *Cussonia umbellifera* Sond., on leaves, Woodbush, *Doidge*, 1774, Type.

*Cussonia spicata* Thunb., Sea View, Durban, *van der Byl 67*, 11360 ; Woodbush, *van der Byl 1521* ; Durban, *van der Byl 49*.

18. **Asterina Bosmanae** Doidge nov. spec. [Plate XXII.]

Colonies always epiphyllous, scattered, thin, greyish black, more or less circular in outline, 2–5 mm. diam., occasionally numerous and becoming confluent ; not on leaf spots, but causing a reddish-brown discoloration of the leaf tissues immediately under the colony.

Mycelium delicate, loosely reticulate, forming an open network with angular meshes. Hyphae buffy brown, usually almost straight, slightly undulating in places, mostly 3·5–4 $\mu$ thick ; cells mostly 20–25 $\mu$ long ; branches usually opposite. Hyphopodia fairly numerous, unilateral or alternate, continuous, briefly cylindrical or subglobose, broadly rounded above, 5–7·5 $\mu$ long, 4·5–5 $\mu$, rarely up to 6 $\mu$ broad.

Thyrothecia numerous, scattered, usually single, but sometimes confluent in small groups of 2–3, more or less circular in outline, 150–180 $\mu$ diam. Basal layer hyaline, delicate, structure not evident. Covering membrane slightly convex, opaque, blackish brown in the centre, more or less pellucid, buffy brown to snuff brown near the margin, composed of radiating hyphae 2·5–4 $\mu$ thick, cells 4–5 $\mu$ long in the centre, 7–10 $\mu$ long nearer the margin ; margin not fimbriate or very sparsely so ; central cells breaking down at maturity to form an irregular pore from which a few radiating cracks develop. Asci not numerous, 3–10 in a single thyriothecium, 8-spored, ovate, broadly rounded above, sessile, with a firm, thick wall, thickened round the apex (ca. 5 $\mu$). Spores conglobate, oblong, broadly rounded at both ends, 1-septate, rather deeply constricted, 21–24 $\mu$ long ; cells subglobose, almost equal, or the upper slightly larger, upper cell 11–12·5 $\mu$ long and 11–11·5 $\mu$ broad, lower 10–11·5 $\mu$ long and ca. 10 $\mu$ broad ; when immature, subhyaline to buffy brown, with a broad darker zone (mummy brown) at each pole and on either side of the septum, later becoming mummy brown and zoning not evident ; thick-walled, wall ca. 1 $\mu$ thick. Paraphysoids fairly numerous.

On *Chrysophyllum magaliesmontanum* Sond., Rooiwal, Eastern Transvaal. *M. Bosman*, 32808.

19. **Asterina delicata** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 253, 274. [Plate XXIII.]

Colonies amphigenous, usually epiphyllous, thin, greyish black, up to 8 mm. diam., often numerous and covering the whole, or a greater part of the upper surface of the leaf.

Mycelium loosely reticulate, pale, delicate. Hyphae slender, vinaceous buff to avellanous, slightly undulating, 3–3·5 μ thick, cells mostly 20–24 μ long, branching irregular. Hyphopodia unilateral or alternate, 1-celled, very rarely 2-celled, 6–10 μ long, 6–10 μ broad, often broader than long, asymmetrical, extremely irregular and varied in shape, straight, curved or hooked, usually obtusely angular or sublobed with 2–3 shallow, blunt irregular lobes.

Thyriothecia scattered or in small groups of 2–3, round or somewhat irregular in outline, 100–150 μ diam. Basal layer hyaline or subhyaline, poorly developed and without recognisable structure. Covering membrane convex, pellucid, avellanous to wood brown, composed of irregularly radiating hyphae, 2·5–3·5 μ thick, with cells, 3–5 μ long, rather loosely compacted; margin not fimbriate or sparsely so; at maturity splitting, by means of radiating fissures, into a number of irregular triangular segments, the central part finally falling away and leaving the developing asci exposed. Asci numerous, ca. 20–30 in each thyriothecium, globose or ovate, sessile, 8-spored, with a firm rather thick wall, 33–40 × 26–33 μ. Spores conglobate, wood brown, oblong, broadly rounded at both ends, 1-septate, constricted, smooth, 20–22 × 10–12 μ; cells subglobose, subequal or the upper slightly broader.

Pycnidia very numerous, similar to the thyriothecia but smaller, 45–100 μ diam. Conidia army brown when mature, without lighter medial band or conspicuous germ spores, ovate, ellipsoid or subglobose, 19–24 × 13–17·5 μ, rather thick-walled, wall about 1·5 μ thick.

On *Grewia lasiocarpa* E. Mey., on leaves, Mayville, Durban, Medley Wood, 9062, Type: Kentani, *Pegler 2436*, 10993.

*Grewia occidentalis* L., Pirie Forest, Kingwilliamstown, *Doidge*, 12297.

The host of the type collection was wrongly indentified and originally given (Doidge l.c. as *Trimeria alnifolia*; *see* also under *Asterina Grewiae*.

20. **Asterina Grewiae** Cke.

Grevillea X (1882) 130. Theissen, Ann. Myc. 10 (1912) p. 189; Theiss., Die Gattung Asterina (1913) p. 76; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 253.

Plate XXIV.

Colonies amphigenous, mostly epiphyllous, irregularly scattered, very thin, greyish black, not sharply defined, up to about 5 mm. diam.: on the upper side of the leaf often very numerous, confluent and covering a great part of the leaf surface; on the lower side often following the course of the larger veins.

Mycelium rather loosely reticulate. Hyphae deep to dark olive buff, almost straight or slightly undulating, 3·5–4·5 μ thick; cells mostly 15–20 μ long; branches frequently opposite and often constricted at the junction with the main hyphae. Hyphopodia numerous, 1-celled, alternate, opposite or unilateral, straight or more or less uncinate, finger- or flask-shaped, less frequently irregular and sublobed, 7·5–10 μ long and 3·5–5 μ broad.

Thyriothecia fairly numerous, scattered or in small groups, usually discrete, only occasionally becoming confluent, round, broadly oval or somewhat irregular in outline, 100–150 μ diam. Basal layer subhyaline to light greyish olive, consisting of loosely radiating hyphae, not membranous. Covering membrane slightly convex, buffy brown, pellucid, becoming subopaque, composed of irregularly radiating, rather loosely compacted hyphae about 3 μ thick, central cells almost cubical, 3–3·5 μ long, marginal cells up to 5 μ long; margin more or less fimbriate, fringing hyphae paler, 2·5–3 μ thick; early splitting into a number of narrow, triangular segments, by stellate fissures which run out almost to the margin, the central part readily breaks away, exposing the asci. Asci ca. 8–10 in each thyriothecium, 8-spored, subglobose, sessile, with a firm, rather thick wall, 32–37·5 × 30–33 μ. Spores conglobate, buffy brown, oblong, broadly rounded at both ends, 1-septate, constricted, smooth, 20–25 × 10–12·5 μ; cells subglobose, subequal or the upper slightly broader (ca. 1 μ) than the lower.

Pycnidia numerous, scattered, similar to the thyriothecia, 50–100 μ diam. Conidia ovate or oblong, 15–20 × 9–12·5 μ, rather thick-walled, wall ca. 1 μ thick, buffy brown, without hyaline band but with conspicuous germ pores; germ pores 4, equatorial, or 8 more or less regularly placed in two equatorial bands.

On *Trimeria grandifolia* (Hochst.) Warb. (= *Trimeria alnifolia* Planch.), on leaves, Inanda, *Medley Wood 639*, 12333 Type; Pirie Forest, Kingwilliamstown, *Doidge*, 12289; Goodoo Bush near Mont-aux-Sources, 14131; Tugela Valley near Mont-aux-Sources, *Doidge*, 14133; Keurkloof Forest, George, *Doidge*, 17128; Storm's River, Humansdorp Distr., *Doidge*, 17184; Woodbush, *Doidge*, 17779; Lundie's Hill near Bulwer, *Doidge*, 30478; Knysna, *Bottomley*, 32245 and *van der Byl 418*; Bloukrantz, *van der Byl 1394*.

There has been some confusion between this fungus and the nearly related species *Asterina delicata*; on examination, this proves to be due to the incorrect indentification of the hosts in Medley Wood's collections. The type collection of *Asterina Grewiae* (*Wood 639*) is not on Grewia but on Trimeria; conversely, the host of *A. delicata* is not Trimeria but Grewia. This conclusion is borne out by an examination of more recent collections in which adequate material of the host plants is available.

20a. **Asterina Grewiae** Cke. var. **zonata** Doidge nov. var.

Hyphopodia more frequently uncinate or sublobed than in the type. Conidia ellipsoid to subclavate, 16–21·5 × 7·5–9 μ, buffy brown, with a conspicuous, hyaline, medial band.

On *Trimeria trinervis* Harv., on leaves, Howieson's Poort, near Grahamstown, *Doidge*, 12382.

21. **Asterina crotoniensis** (Doidge) Ryan.

Stevens and Ryan, The Microthyriaceae (1939) p. 52.

Syn.: *Asterina crotonicola* Doidge (not Pat.), Bothalia I (1922) p. 76. [Plate XXV.]

Colonies amphigenous, but predominantly epiphyllous, thickly or sparsely scattered, thin, black, circular or somewhat irregular in outline, 2–5 mm. diam., or forming larger, irregular colonies by confluence.

Mycelium rather closely reticulate. Hyphae undulating, 3–5 μ thick, pellucid; older hyphae brownish olive, young hyphae paler, shading to isabella colour or dark olive buff at the tips of the branches; cells 10–25 μ long; branches alternate or unilateral, anastomosing freely. Hyphopodia fairly numerous, alternate or unilateral, occasionally opposite, 1-celled, mostly at right angles to the hyphae, usually more or less pear-shaped, less frequently uncinate or sublobed and irregular in form, 5–7·5 μ long, 3·5–5 μ broad.

Thyriothecia fairly evenly and closely distributed, not infrequently in groups of 2–5, which become more or less confluent, circular or somewhat irregular in outline, 100–140 μ diam. Basal layer indistinct, subhyaline, without recognisable structure. Covering membrane convex, about 50 μ high in the centre, light brownish olive, becoming darker, subopaque, formed of straight or slightly undulating, radiating hyphae 2·5–3·5 μ thick, central cells almost cubical, marginal cells up to 10 μ long; not very firmly compacted and early splitting into a number of triangular segments by irregular stellate fissures, which reach almost to the margin; margin not fimbriate. Asci 8-spored, subglobose or ovate, sessile, 36–40 × 23–33 μ. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, slightly or rather deeply constricted, dark olive buff, becoming light brownish olive, pellucid, verrucose-echinulate, 16–20 × 7·5–11 μ; upper cell usually broader, lower often tapering slightly to the rounded base.

Pycnidia numerous, interspersed with the thyriothecia and similar to them but smaller, up to 100 μ diam. Conidia ovate, pyriform or ellipsoid, light brownish olive to brownish, continuous, without lighter medial band, 17–20 × 10–13 μ; germinating through a pore at the base.

On *Croton rivularis* Muell., on leaves, East London, *Doidge*, 12427, Type, and 22412; Langholm Estates, Bathurst, *Doidge*, 12355; Donkerbosch, Grahamstown District, *Britten 5452*, 22340; Alexandria, *Doidge*, 22359; Woodville Forest, George, *Doidge*, 11018.

22. **Asterina Trichiliae** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) p. 253. [Plate XXVI.]

Colonies epiphyllous, scattered irregularly, usually more or less circular in outline, up to 6 mm. diam., thin, black.

Mycelium more or less reticulate, meshes of network angular. Hyphae dark olive buff to buffy brown, straight or nearly so, 4–6 $\mu$ thick; cells mostly 15–25 $\mu$ long; branches often opposite and frequently at right angles to the hyphae. Hyphopodia numerous, unilateral, alternate or opposite, 1-celled, often at right angles to the hyphae, more or less cylindrical, finger-shaped or flask-shaped, mostly straight, less frequently lightly curved, rarely sublobed, 6–10 $\mu$ long, 4–5 $\mu$ broad.

Thyriothecia scattered or in groups, circular or slightly oval in outline or somewhat irregular, 150–220 $\mu$ diam.; often closely crowded in groups of 2–4, becoming confluent, and forming larger, compound ascomata. Basal layer thin, subhyaline, without recognisable structure. Covering membrane slightly convex, pellucid, composed of straight, radiating hyphae 3–4 $\mu$ thick, central cells olive brown, subopaque, 5–6 $\mu$ long, marginal cells paler, 7–8 $\mu$ long; margin fimbriate, fringing hyphae deep to dark olive buff, almost straight, septate, 2·5–3·5 $\mu$ thick and up to 130 $\mu$ long; at maturity splitting into a large number of narrow, triangular segments by means of radiating fissures, the central part breaking away readily. Asci few, up to ca. 10 in each thyriothecium, 8-spored, globose or broadly ovate, sessile, 40–55 × 43–50 $\mu$. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, constricted, dark olive buff to olive brown, densely and minutely verruculose, 24–29 $\mu$ long; cells subglobose or broadly ovoid, upper broader, 12·5–16 $\mu$ long and 13–15 $\mu$ broad, lower 10–12·5 $\mu$ long and 10–12·5 $\mu$ broad.

On *Trichilia emetica* Vahl. (= *Trichilia Dregeana* Mey.) on leaves, Winkle Spruit, *Doidge*, Type, 9006; Louis Trichardt, *V. A. Patterill*, 11833.

23. **Asterina Trichocladi** Doidge nov. spec. [Plate XXVII.]

Colonies epiphyllous, widely scattered, very thin, greyish black, more or less circular in outline and up to 5 mm. diam.; not sharply defined and, on the leaf, only the thyriothecia visible to the naked eye as black pin points.

Mycelium delicate, very loosely reticulate. Hyphae pellucid, deep to dark olive buff, undulating slightly, 2·5–3·5 $\mu$ thick, rather obscurely septate, cells mostly 15–20 $\mu$ long, branching irregular. Hyphopodia few, remote, solitary, alternate or unilateral, continuous, subglobose or pulvinate to cylindrical, often flattened, less frequently more or less pyriform, rarely sublobed, often broader than long, 5–7·5 $\mu$ long, 5–7 $\mu$ broad.

Thyriothecia numerous, scattered, usually discrete but occasionally confluent, formed at the tips of lateral branches, which are usually very short, often 1-celled; at first fan-shaped but very rapidly becoming circular, 250–380 $\mu$ diam. Basal layer subhyaline, delicate, structure not evident. Covering membrane slightly convex, at first olive buff, soon becoming isabella colour and finally subopaque in the centre, formed of sinuous radiating hyphae 2·5–3·5 $\mu$ thick, with cells 5–7·5 $\mu$ long; margin entire, crenate, not fimbriate; at first closed, central cells breaking down early and forming a pore. Asci rather numerous, 8-spored, oblong to subclavate, rounded above, narrowed below rather abruptly into a short, peg-like foot, 50–72·5 × 17–18 $\mu$. Spores distichous to conglobate, oblong, rounded at both ends, 1-septate, slightly constricted, deep to dark olive buff, smooth, thin-walled, 13–15 × 6–7 $\mu$; cells subequal or the upper slightly broader. Paraphyses numerous, fibrose, breaking down as the asci approach maturity, into a yellowish-brown mucilaginous mass.

On *Trichocladus crinitus* Pers., on leaves, Knysna, *Bottomley*, 32231; Deepwalls, Knysna, *Bottomley*, 32211.

24. **Asterina raripoda** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 254, 276. [Plate XXVIII.]

Colonies epiphyllous, thin, greyish black, more or less circular in outline, 3–5 mm. diam., scattered or becoming confluent and forming larger, irregular colonies.

Mycelium deep to dark olive buff, radiating, becoming very loosely reticulate. Hyphae more or less sinuous, 3·5–5 $\mu$ thick, rather closely septate, cells mostly 10–15 $\mu$ long; branching distant, irregular. Hyphopodia few, alternate or unilateral, rather distant, 1-celled, hemispherical to subglobose, 5–7·5 $\mu$ diam., or 4·5 $\mu$ long and 6–7 $\mu$ broad; occasionally 2-celled, clavate, with subglobose terminal cell, 10–11 $\mu$ long and 5–6 $\mu$ broad.

Thyriothecia fairly numerous, scattered or becoming confluent in groups of 2–4; arising at the tips of very short, or longer hyphal branches and often fan-shaped at first, rapidly becoming more or less circular in outline, 150–220 $\mu$ diam. Basal layer hyaline, poorly developed, structure not evident; covering membrane slightly convex, buffy brown to snuff brown, pellucid, becoming subopaque in the centre, formed of irregularly radiating,

somewhat tortuous hyphae, mostly 2–3 μ thick, with cells 5–6 μ long in the centre, 6–10 μ long near the margin; margin irregular, not fimbriate or very sparsely so; central cells breaking down and forming an irregular pore from which radiating fissures finally develop. Asci fairly numerous, ca. 20–30 in each thyriothecium, usually 8-spored, sometimes 4–6-spored, ellipsoid to subclavate, rounded above, narrowing below gradually or abruptly into a short peg-like foot, 50–60 × 17–20 μ, with a firm, thick wall. Spores distichous to conglobate, subclavate, rounded at the ends or lower end subacute, 1-septate, constricted, smooth, buffy brown with two more or less distinct, transverse, hyaline bands in each cell, 15–21·5 μ long; upper cell broader and more broadly rounded, ovoid to subglobose, 8–10 μ long and 7·5–10 μ broad, lower ellipsoid to cuneate, 7–10 μ long and 6–7 μ broad; occasionally 4-spored asci contain two normal 1-septate spores and two 1-celled spores, the latter being fusoid or ovoid, tapering to blunt ends or rounded above, 17·5–19 × 10–11·5 μ, with two transverse, hyaline bands.

On *Ansellia africana* Lindl., on leaves, Zululand, *Franks*, 6687.

25. **Asterina Pavoniae** Werd.

Rep. Spec. Nov. Reg. Veg. XIX (1923) p. 50. [Plate XXIX.]

Colonies amphigenous, mostly epiphyllous, only occasional, scattered colonies being found on the under side of the leaf, scattered, black, round to irregular, 1–2 mm. diam.; usually very numerous on the upper side of the leaf, becoming more or less confluent and covering a great part of the leaf surface.

Mycelium at first radiating, early becoming more or less reticulate, often forming a rather close network in the neighbourhood of the thyriothecia. Hyphae deep olive buff near the growing tips, becoming buffy brown, deeply undulating, 3·5 μ thick, mostly 1 μ, not infrequently running parallel with one another, becoming fused and forming strands of 2–3 hyphae; rather indistinctly septate, cells mostly 12–18 μ long; branching irregular, Hyphopodia fairly numerous, alternate or unilateral, 1-celled, 5–8 μ, rarely up to 10 μ long, 6–10 μ broad, often broader than long, typically 3-lobed, with rather shallow, rounded lobes, less frequently 2–4-lobed, symmetrical or irregular.

Thyriothecia numerous, closely crowded, especially near the centre of the colony, 75–100 μ diam., more or less circular, rarely discrete, becoming fused in groups of 2 to many, and thus forming larger, irregular, compound ascomata. Basal layer subhyaline, delicate, without recognisable structure. Covering membrane slightly convex, at first pellucid, dark olive buff to buffy brown, becoming darker, subopaque, composed of rather loosely compacted, slightly undulating, radiating hyphae, 3–4 μ thick; central cells 2–4 μ long, marginal cells somewhat longer; margin not fimbriate; splitting at maturity into a number of triangular segments by means of irregularly radiating cracks, the central part finally falling away and exposing the developing asci. Asci numerous, up to 25 in each thyriothecium, 8-spored, ovate or subglobose, broadly rounded above, sessile, 35–42 × 25–40 μ. Spores conglobate, oblong, rounded at both ends, 1-septate, constricted, smooth, buffy brown, pellucid, 14–16 μ long; cells about equal in length, subglobose, upper 8–9 μ broad, lower 7–7·5 μ.

Pycnidia numerous, similar to the thyriothecia and interspersed with them, 50–90 μ diam. Conidia buffy brown to olive brown, without lighter medial band, ovate, oblong or subglobose, 14–24 × 10–13 μ.

On *Sida Hislopii* Burtt Davy & Gr., on leaves, Durban, *van der Byl 396*, Type; Umkomaas, *Bottomley*, 11894.

Werdermann (l.c.) assigns this species to the sub-genus Clypeolaster, but no definitely radiating basal membrane can be observed in the thyriothecia. The conidia are not as long as stated in the original description, where the measurements are given as 18–30 × 10–13 μ. The type is not on *Pavonia* sp., but on *Sida Hislopii*.

26. **Asterina xumenensis** Doidge nov. spec. [Plate XXX.]

Colonies amphigenous and caulicolous, not conspicuous, thin, greyish black, minute, up to 1 mm. diam., scattered irregularly, discrete or tending to become confluent. Mycelium loosely reticulate. Hyphae ecru olive to light brownish olive, more or less undulating, 2·5–3·5 μ thick, indistinctly septate, cells about 20 μ long; branching rather distant, irregular. Hyphopodia fairly numerous, solitary, unilateral or alternate, rarely opposite, 1-celled, very rarely 2-celled, very variable in form, erect, curved or appressed to the hyphae, usually more or less lobed, sometimes palmately lobed, but usually asymmetrical, often

broader than long, with 2–4 rounded, shallow or deeper lobes, rarely subcylindrical and more or less sinuous, 5–11 μ long and 5–10 μ broad, occasional 2-celled hyphopodia up to 12·5 μ long.

Thyriothecia scattered or crowded ; arising at the tips of short hyphal branches, at first fan-shaped but rapidly becoming round to irregular in outline, 65–100 μ diam., often fusing laterally in groups of 2, 3 or more, and then forming compound ascomata which are elliptic or irregular in outline. Basal layer thin, subhyaline and without recognisable structure. Covering membrane slightly convex, at first pellucid, light brownish olive, becoming darker, subopaque, composed of radiating hyphae 2–2·5 μ thick, cells 3–5 μ long, not appreciably longer near the fimbriate margin ; splitting at maturity, by stellate fissures, into a number of triangular segments. Asci rather numerous, ovate or ovate-globose, sessile, 8-spored, 18–20 × 11–16 μ. Spores conglobate, deep olive buff, oblong, broadly rounded at both ends, slightly constricted, smooth, 11–12·5 × 5–6 μ ; upper cell somewhat broader than the lower, which tapers slightly to the rounded end.

Pycnidia similar to the thyriothecia, but smaller, 37·5–50 μ diam. Conidia oblong, ellipsoid to subclavate, light brownish olive with a lighter medial band, 10–15 × 4–6 μ.

On *Lobelia stellarioides* Bth. & Hk., Xumeni Forest, near Donnybrook, *Morgan and Doidge*, 30483, Type, and *Doidge* 32236.

27. **Asterina undulata** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 258, 278. [Plate XXXI.]

Colonies epiphyllous, black, more or less circular in outline, 0·5 to 3 mm. diam., scattered, discrete, or very numerous and becoming confluent, often covering the whole leaf surface.

Mycelium loosely reticulate, meshes curved, not angular. Hyphae ecruolive, deeply undulating in more or less regular waves, 5-6·5 μ thick ; cells mostly 15–22 μ long ; branching distant, irregular. Hyphopodia fairly numerous, unilateral or alternate, 1-celled, broader than long, usually 5–6·5 μ long and 7–10 μ broad ; more or less lobed and cut, sometimes palmately lobed, but often asymmetrical, with 2 5 rounded, shallow or deeper lobes ; rarely almost entire, and then bolster-shaped or bluntly conical.

Thyriothecia developing at the tips of short hyphal branches, at first fan-shaped, rapidly becoming more or less circular in outline, 100–150 μ diam. ; occasionally solitary, but usually developing in small groups and becoming fused in groups of 2–4 or more, thus forming larger irregular compound ascomata. Basal layer subhyaline, poorly developed, structure not evident. Covering membrane slightly convex, buffy olive, pellucid, formed of radiating hyphae 2·5–3 μ thick, cells 4–8 μ long, not appreciably longer near the margin, which is not fimbriate ; splitting at maturity into triangular segments, by irregularly radiating fissures. Asci rather numerous, ovate, 8-spored, broadly rounded above, sessile, 20–24 × 17–20 μ. Spores conglobate, ovate-ellipsoid, olive buff or olive ecru, smooth, broadly rounded at both ends, 1-septate, constricted, 13–15 × 6–8·5 μ ; upper loculus slightly broader.

On *Viola abyssinica* Steud., on leaves, Woodbush, Northern Transvaal, *Doidge* 1769 Type.

28. **Asterina Streptocarpi** Doidge.

Bothalia I (1924) p. 203. [Plate XXXII.]

Colonies epiphyllous, black, minute, round to irregular in outline but not sharply defined, up to 3 mm. diam.

Mycelium radiating, becoming loosely reticulate, or, in the larger colonies, more closely reticulate. Hyphae ecru olive to buffy olive or isabella colour to snuff brown, undulating, 3–4 μ thick, in places up to 5 μ thick, cells mostly 16–20 μ long, branching irregular. Hyphopodia fairly numerous, alternate or unilateral, lobed ; erect, palmately lobed, more or less symmetrical, or more or less curved and bent, asymmetrical ; deeply 3–5-lobed, mostly 3-lobed, lobes rounded or bilobulate ; 6–10 μ long, usually broader than long, 8–13·5 μ broad.

Thyriothecia formed at the tips of short hyphal branches, at first fan-shaped, rapidly becoming circular or somewhat irregular in outline, scattered or in groups, 100–160 μ diam., often fusing laterally in small groups of 2–4 and forming larger, irregular, compound ascomata. Basal layer subhyaline, delicate, without recognisable structure. Covering membrane convex, pellucid, concolorous with the hyphae, composed of rather loosely compacted, radiating hyphae 2·5–3 μ thick, cells 5–6 μ long, not appreciably longer near

the margin, which is more or less fimbriate; splitting at maturity, by means of stellate fissures, into several triangular segments. Asci 4-spored, globose or broadly ovate, broadly rounded above, sessile, 20–24 × 23–24 μ. Spores conglobate, oblong, rounded at both ends, 1-septate, slightly constricted, smooth, snuff brown, 15–18 μ long; cells subequal, or the upper slightly broader, upper 7·5–9 μ broad, lower 7–7·5 μ.

On *Streptocarpus Rexii* Lindl., on leaves, Deepwalls, Knysna, *Doidge*, 17223, Type; Deepwalls, *Laughton*, 30985 and *van der Byl 2301*.

*Streptocarpus* sp., Knysna, *Laughton*, 32078.

In all collections, the material is heavily parasitised by *Dimerium intermedium* and *Actinopeltella nitida*.

29. **Asterina gerbericola** Doidge.

Bothalia I (1924) p. 202. [Plate XXXIII.]

Colonies epiphyllous, scattered or more or less confluent, round to irregular in outline, up to 5 mm. diam. Mycelium delicate, radiating, becoming loosely reticulate. Hyphae ecru olive to light brownish olive, sinuous, 3–3·5 μ thick; cells 20–30 μ long, mostly 24–27 μ; branching rather distant, irregular. Hyphopodia not very numerous, alternate or unilateral, 1-celled, erect or hooked, often appressed to the hyphae, often broader than long, 6–10 μ long and 8–15 μ broad; palmately or irregularly lobed, with 3–5 rounded, truncate or bilobulate lobes, often 5-lobed.

Thyriothecia formed at the tips of short hyphal branches, at first fan-shaped, soon becoming circular in outline or somewhat irregular, scattered or in groups, 100–130 μ diam., often fusing in groups of 2–4 and forming larger, irregular, compound ascomata. Basal layer thin, delicate, subhyaline, structure not evident. Covering membrane slightly convex, composed of rather loosely compacted, radiating hyphae 2–2·5 μ thick, cells mostly 5–6 μ long, not noticeably longer at the margin; at first concolorous with the mycelium, later becoming darker and subopaque in the centre; splitting at maturity, by means of stellate radiating cracks, into several triangular segments. Asci 8-spored, ovate to subglobose, sessile, broadly rounded above, 23–30 × 20–25 μ, with a rather thick, firm wall. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, slightly constricted, brownish olive, subopaque, conspicuously verruculose, 13·5–17 μ long; upper cell broader, 7·5–9 μ broad, lower 6·5–7·5 μ broad.

On *Gerbera cordata* Less., on leaves, Storm's River, *Doidge*, 17175, Type, Caradoc's Bush, Knysna, *Bottomley*, 32127; Deepwalls, Knysna, *Bottomley*, 32123.

*Gerbera piloselloides* Cass., Deepwalls, Knysna, *J. Phillips* (*van der Byl 2223*), 20381.

30. **Asterina woodiana** Doidge nov. comb.

Syn.: *Asterinella woodiana* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 266.
*Prillieuxina woodiana* (Doidge) Ryan in Stevens and Ryan, The Microthyriaceae (1939) p. 78. [Plate XXXIV.]

Colonies hypophyllous, thin, greyish black, effuse, irregular in outline, not sharply defined.

Mycelium loosely or more closely reticulate. Hyphae slender, deep olive buff to avellanous and wood brown, more or less undulating, often tortuous, 2·5–4 μ thick, branching freely and irregularly, septation obscure and irregular. Hyphopodia not numerous, alternate or unilateral, 1-celled or with a 1–5-celled stipe; 1-celled hyphopodia, or terminal cell of stipitate hyphopodia, clavate, cylindrical or irregular in shape, straight, bent or uncinate, 5–10 μ long, 3–6 μ broad; stipe 1–5-celled, slender, sinuous, very variable in length, 2·5–3 μ thick.

Thyriothecia fairly numerous, scattered, usually discrete, occasionally confluent in small groups of 2–3, rarely more, more or less circular in outline, 140–160 μ diam. Basal layer hyaline, indistinct, structure not evident. Covering membrane slightly convex, pellucid, buffy brown to snuff brown, becoming darker and subopaque in the centre, composed of radiating hyphae 2–3 μ thick, central cells almost cubical, marginal cells slightly longer, 3–5 μ long; margin entire, crenate or lobed, not fimbriate; at maturity breaking into a few broad triangular segments through the formation of radiating, stellate cracks. Asci broadly ovate, sessile, 8-spored, 33–37 × 27–30 μ. Spores conglobate, oblong, broadly rounded at both ends, almost equally 1-septate, slightly constricted, snuff brown, smooth, 20–25 × 10–11 μ; cells equal or the upper slightly larger.

Pycnidia numerous, similar to the thyriothecia but smaller, 60–100 μ diam. Conidia avellanous, without hyaline band, broadly ellipsoid, ovate or broadly fusoid, 14–16 × 8–10 μ.

On *Cryptocarya Woodii* Engl., on leaves, Mayville, Durban, *Medley Wood*, 9025, Type : Berea, Durban, *van der Byl*, 11362.

The hyphopodia, which are not numerous and are rather inconspicuous, were overlooked when this fungus was described as an Asterinella.

31. **Asterina uncinata** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 252, 278. [Plate XXXV.]

Colonies hypophyllous, not on leaf spots, black, conspicuous, round, up to 6 mm. diam., or, when numerous, becoming confluent and covering larger areas of the leaf surface, especially near the leaf margins ; sometimes covering the whole lower surface of the leaf.

Mycelium reticulate ; primary hyphae buckthorn brown to cinnamon brown, radiating, somewhat undulating, rather stout, 5–6 $\mu$ thick, cells 15–35 $\mu$ long, often fusing longitudinally with parallel hyphae to form radiating strands ; numerous branches and secondary hyphae paler, rather more slender, usually 4–5 $\mu$ thick and more definitely undulating ; the latter form, with the hyphopodia, a more or less dense network between the primary hyphae. Hyphopodia alternate, unilateral or opposite, stipitate, 20–40 $\mu$ long, or rarely continuous, 13–15 $\mu$ long, uncinate, in the denser parts of the mycelial network becoming contorted and fusing with each other, or with adjacent hyphae ; stipe 1–3-celled, 7–30 $\mu$ long, cylindrical, equal in thickness to the hyphae, straight, curved, abruptly geniculate or gibbous and contorted, occasionally bearing two terminal cells ; terminal cell club-shaped or cylindrical, straight, uncinate or sinuous, occasionally sublobed, 10–15 $\mu$ long and 5–6·5 $\mu$ broad.

Thyriothecia numerous, scattered, large, buckthorn brown, round or somewhat irregular in outline, 200–250 $\mu$ diam., rarely up to 280 $\mu$ diam., usually single, rarely, fusing in groups of 2 or more to form larger composite thyriothecia ; covered with a network of darker, mycelial hyphae. Basal layer hyaline or subhyaline, without recognisable structure. Covering membrane convex, 60–80 $\mu$ high in the centre, buckthorn brown to cinnamon brown, composed of radiating hyphae 3–5 $\mu$ thick, with cells 3·5–7 $\mu$ long ; these are prolonged at the margin into a short, dense fringe of paler, tortuous hyphae ; at maturity splitting, by means of stellate fissures, into a number of more or less triangular segments, then breaking up irregularly. Asci numerous, 20–30 in each thyriothecium, 8-spored, subglobose to ovate, sessile, 45–55 × 40–50 $\mu$, with a firm, stout wall, ca. 1 $\mu$ thick, thickened round the apex when immature. Spores conglobate, oblong, rounded at both ends, 1-septate, deeply constricted, smooth, cinnamon brown, subopaque and almost black when mature, 29–34 × 16–20 $\mu$ ; cells subglobose to ovoid, the upper larger, 16–20 $\mu$ long and 16–19 $\mu$ broad, the lower 12·5–15 $\mu$ long and 14–15 $\mu$ broad ; the cells separate rather readily at the septum ; immature, hyaline spores are apparently surrounded by a colourless, mucilaginous envelope.

On *Scolopia Mundtii* Presl., on leaves, Brander's High Forest, Victoria East, *van der Byl*, 9463b, Type : Goodoo Bush, near Mont-aux-Sources, *Doidge*, 14134 ; Hogsback, Cape, *K. M. Putterill*, 30073.

This fungus was originally described (Doidge, loc. cit.) " on leaves of *Rhamnus prinoides*, 9463 ". Every leaf remaining of this collection has been examined, but this conspicuous fungus is not evident on this, nor on other collections of *Rhamnus prinoides* ; all that remains in connection with the collection numbered 9463, is the slide from which the species was described. The two collections on *Scolopia Mundtii* cited above agree with the fungus on this slide in every detail ; the species is very distinctive. It can only be concluded that some leaves of *Scolopia Mundtii* were originally mixed with those of Rhamnus in collection 9463 ; the fungus has been redescribed from No. 14134.

32. **Asterina reticulata** Kalch. & Cke. emend. Doidge.

Kalchbrenner and Cooke, Grevillea IX (1880) p. 33 ; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 252.

Syn : *Meliola Oliniae* Kalch. in Herb. MacOwanianum.

*Asterostomella reticulata* (Kalch. & Cke.) v. Höhn., Fragm. z. Myk. 493 ; Theissen, Die Gattung Asterina (1913) p. 34. [Plate XXXVI.]

Colonies amphigenous, but more numerous on the upper side of the leaf, thin, black, round to irregular in outline, often numerous, especially on the veins and leaf margins, frequently coalescent and covering the greater part of the leaf surface.

Mycelium rather closely reticulate, occasionally, in the centre of the colony, very closely compact, and with hardly any spaces between the hyphae. Hyphae tawny olive, straight or more or less undulating, 4·5–6 μ thick ; branching freely, branches often opposite ; cells mostly 15–25 μ long. Hyphopodia fairly numerous, alternate or unilateral, 2-celled, straight, curved or hooked, 7–15 μ long ; basal cell cylindrical, equal in thickness to the hyphae, 3·75–5 μ long ; terminal cell ovate, cylindrical or irregular and sublobed, 6–10 μ broad.

Thyriothecia comparatively rare, round or somewhat irregular in outline, 160–200 μ diam. Basal layer pale smoke grey, structure not evident. Covering membrane slightly convex, cinnamon brown, becoming more decidedly convex and subopaque, composed of radiating hyphae, 3–3·5 μ thick, central cells almost cubical, 3–4 μ long, marginal cells up to 7·5 μ long ; margin fimbriate ; at maturity splitting, by numerous radiating fissures into a number of narrow, triangular segments, the centre of the covering membrane finally falling away and exposing the asci, which are embedded in ochraceous mucilaginous matter. Asci 8-spored, ovate, sessile, 45–50 × 30–33 μ. Spores conglobate, oblong, rounded at both ends, 1-septate, rather deeply constricted, smooth, snuff brown, 20–23 × 9–11 μ ; cells subglobose, subequal, or the upper slightly broader.

Pycnidia very numerous, similar to the thyriothecia but smaller, 100–150 μ diam. Conidia ellipsoid, ovate or pyriform, snuff brown with a hyaline medial band, 16–20 × 7–12·5 μ.

On *Olinia cymosa* Thunb., Boschberg Mts., near Somerset East, *MacOwan 1336*, Type, (Rabb. Wint. Fung. Eur. 3337) 3677, 20800, 21944 ; Goodoo Bush near Mont-aux-Sources, *Doidge*, 14136 ; Deepwalls, Knysna, *Doidge*, 17199 ; Knysna, *van der Byl 2282, 2284* ; Addo Bush, *J. Phillips*, 21012.

*Olinia emarginata* Burtt Davy, Mont-aux-Sources, Natal, *Doidge* 23402 ; Schurink's Kloof, Lydenburg, *Obermeyer and Verdoorn, 34*, 30477.

*Olinia radiata* Hofmeyr & Phillips, Ingeli Forest, Natal, *Chilvers*, 30462.

*Olinia* sp., Barberton, *Galpin 1275*, 15497.

The thyriothecia of this fungus were described (Doidge, loc. cit.) from No. 15497 ; more recently some thyriothecia, mostly immature, have been found on a portion of the type collection, labelled " Herbarium MacOwanianum No. 1336 Crypt. Austro-africana, *Meliola Oliniae* Kalch. Type " ; this specimen is No. 20800 in the Cryptogamic Herbarium at Pretoria. There are also some thyriothecia on No. 17199, but they are comparatively few.

33. **Asterina Scolopiae** Doidge.

Bothalia I (1922) p. 77. [Plate XXXVII.]

Colonies amphigenous, mostly hypophyllous, thin, greyish black, round to irregular in outline, up to 5 mm. diam. ; when numerous coalescing to form larger irregular blotches, especially along the veins and leaf margins.

Mycelium delicate, loosely reticulate. Hyphae deep to dark olive buff, straight or slightly undulating, 3–3·75 μ thick ; cells mostly 20–25 μ long ; branching irregular. Hyphopodia fairly numerous, alternate or unilateral, 2-celled, mostly cylindrical, straight, frequently at right angles to the hyphae ; less frequently clavate, slightly curved or subuncinate ; 10–19 μ long and 3–4 μ, rarely up to 5 μ, broad, basal cell cylindrical, 3·5–6 μ long.

Thyriothecia fairly numerous, scattered, not infrequently connate in pairs, rarely in groups of 3–5 units, circular in outline, or becoming somewhat angular when in contact, 130–170 μ diam. Basal layer poorly developed, structure not evident. Covering membrane slightly convex, olive brown, subopaque, composed of radiating hyphae 2·5–3 μ thick, cells almost cubical, 3–4 μ long near the centre, up to 5 μ long near the margin ; margin more or less fimbriate, fringing hyphae greyish olive to light greyish olive, 2·5–3 μ thick, tortuous and up to ca. 75 μ long. Asci up to 10 in each thyriothecium, 8-spored, subglobose to ovate, sessile, 32–40 × 30–35 μ, with a firm, thick wall. Spores conglobate, oblong, rounded at both ends, 1-septate, slightly constricted, buffy brown, smooth, 20–25 × 9–11 μ ; cells subequal or the upper slightly broader.

Pycnidia similar to the thyriothecia but smaller, 70–120 μ diam. Conidia olive brown, without lighter medial band, usually rhomboid, with 4 conspicuous, hyaline, papillate germ pores at the angles, less frequently ovate to clavate, rarely ellipsoid, with 4 subequatorial germ pores, 17–25 × 10–13·5 μ.

On *Scolopia Zeyheri* (Szysz.) Nees, on leaves, East London, *Doidge* 12414, Type; Hog's Back, *K. M. Putterill*, 30084; Alexandria, *Doidge*, 22422; Kentani, *Pegler*, 8393a. *Scolopia Zeyheri* (Szysz.) Nees var. *spinosa*, Mossel Bay, *Pole Evans*, 9067b. *Scolopia Mundtii* Presl., Long Ridge, Knysna, *Doidge*, 17227.

34. **Asterina Saniculae** Doidge nov. spec. [Plate XXXVIII.]

Colonies amphigenous, black, more or less circular in outline, 1–2·5 mm. diam.; sometimes numerous and confluent, and then forming larger irregular blotches.

Mycelium reticulate, meshes of network curved, not sharply angular. Hyphae tawny olive, paler at the growing tips, deeply undulating, 3–5 $\mu$ thick, cells mostly 20–25 $\mu$ long, branching usually alternate. Hyphopodia 2-celled, very rarely 1- or 3-celled, alternate or unilateral, at right angles to the hypha or inclined towards it, straight, curved or uncinate, 10–15 $\mu$ long; basal cell straight or curved, 2·5–7·5 $\mu$ long, cylindrical, 3·5–4 $\mu$ thick, rarely gibbous; terminal cell very irregular, erect, symmetrical, or curved or hooked and asymmetrical, usually more or less lobed, with 2 5 rounded or truncate lobes, 7·5–11 $\mu$ broad.

Thyriothecia very numerous, crowded, 100–130 $\mu$ diam., round to irregular in outline, often fusing laterally and forming large, irregular, compound ascomata, but not infrequently fused in an irregular circle near the centre of the colony. Basal layer delicate, subhyaline, structure not evident; occasionally pale greyish fuscous, with a delicate radiating structure which readily falls apart under pressure. Covering membrane at first concolorous with the mycelium, becoming dark brown and subopaque, convex, composed of radiating hyphae 2·5–3·5 $\mu$ thick, with cells 3·5–5 $\mu$ long in the centre, somewhat longer, up to 8 $\mu$ long near the margin; margin not fimbriate, or very briefly and sparsely so; splitting at maturity into triangular segments by means of stellate fissures. Asci 8-spored, fairly numerous, up to ca. 20 in each thyriothecium, ovate or subglobose, sessile, 20–25 × 17·5–20 $\mu$, with a firm, rather thick wall. Spores conglobate, tawny olive, oblong, rounded at both ends, smooth, 1-septate, slightly constricted, 12·5–15 × 5–6·25 $\mu$; upper cell slightly broader than the lower.

On *Sanicula europaea* L., Woodbush, *Doidge* 28331, Type.

It is possible that this species should be placed in the section Clypeolaster, but the basal layer is composed of loosely radiating hyphae, and is not typically membranous.

35. **Asterina fimbriata** Kalch. et Cke.

Grevillea IX (1880) p. 33. Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 251.

Syn.: *Meliola Sclerochitonis* Kalch., Crypt. Austro-afric. Herb. MacOwan 1290.
*Asterina punctiformis* Lév. var. *fimbriata* Theissen, Die Gattung Asterina (1913) p. 67. [Plate XXXIX.]

Colonies epiphyllous, scattered, thin, inconspicuous, 1–2·5 mm. diam., more or less circular, becoming confluent when numerous, and covering larger areas of the leaf surface.

Mycelium loosely reticulate. Hyphae buffy brown, undulating or almost straight, 4–6 $\mu$ thick, cells mostly 16–22·5 $\mu$ long, branching rather remote, irregular. Hyphopodia numerous, alternate or unilateral, rarely opposite, 2-celled, usually hooked or boot-shaped, rarely symmetrical, 8–12 $\mu$ long; basal cell usually cylindrical, 3–5 $\mu$ long and 4–5 $\mu$ broad, rarely gibbous; terminal cell 6–10 $\mu$ broad, irregular in form and usually with 2–3 broad, shallow lobes.

Thyriothecia numerous, often crowded and becoming fused laterally in groups of two or more, irregularly circular in outline, 130–170 $\mu$ diam., or oval, 170–180 × 130–150 $\mu$. Basal layer hyaline or subhyaline, without recognisable structure. Covering membrane slightly convex, buffy brown to olive brown, becoming subopaque, formed of radiating hyphae, 3·5–4 $\mu$ thick, central cells almost cubical, cells near the margin 5–6 $\mu$ long; margin fimbriate, fringing hyphae paler, somewhat tortuous, remotely septate, ca. 3 $\mu$ thick and up to 100 $\mu$ long; dehiscing by means of a number of radiating fissures, the central part finally breaking away and exposing the asci. Asci fairly numerous, 8-spored, globose, 28–34 $\mu$ diam., or ovate, 36–48 × 26–28 $\mu$. Spores conglobate, olive brown, oblong, rounded at both ends, 1-septate, slightly constricted, punctate, 17·5–22 × 8–10 $\mu$; cells subequal or the upper slightly broader.

On *Sclerochiton harveyanus* Nees, on leaves, " in silvis ad lat. Mtis Boschberg, C.B.S., Nov. LXXVI, Herb. MacOwan No. 1290, Crypt. Austr. Afr.", Type (Herb. Kew and Herb. S. Afr. Museum, Capetown, No. 33496); East London, *Doidge*, 10910, 10900; Pirie Forest, Kingwilliamstown, *Doidge*, 12329.

*Hypoestes aristata* R. Br., Inanda, *Medley Wood 608*, 10189, and Herb. Kew.
*Thunbergia* sp., East London, *Doidge*, 12268; Buccleuch, near Cramond, Natal, *Doidge*, 11584

In a previous paper (Doidge l.c.) the host of No. 10900 was erroneously given as *Plectronia ciliata*.

36. **Asterina Combreti** Syd.

Engl. Bot. Jahrb. 44 (1910) p. 264; Theissen, Die Gattung Asterina (1913) p. 249; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 249.

Syn.: *Hyphaster kutuensis* P. Henn., Bot. Ergebnisse der Kunene-Sambesi Exped. (1903) p. 169.
*Asterina* (*Dimerosporium*) *kutuensis* (P. Hönn.) v. Hohn., Fragm. z. Myk. 12, No. 599.
*Asterina Combreti* var. *kutuensis* (P. Hönn.) v. Hohn., Theiss. Die Gattung Asterina (1913) p. 63. [Plate XL.]

Colonies amphigenous, mostly epiphyllous, not on leaf spots, scattered, thin, black, round to irregular in outline, often very numerous on the upper side of the leaf and covering the greater part of its surface.

Mycelium reticulate, forming a fairly close and regular network, of which the meshes are often almost rectangular. Hyphae buffy brown, sometimes paler, deep colonial buff, straight or slightly undulating 3–4·5 $\mu$ thick, less frequently up to 5 $\mu$ thick; cells usually 15–20 $\mu$ long; branches numerous, often opposite. Hyphopodia fairly numerous, alternate or unilateral, 2-celled, straight or more or less curved, 8–17·5 $\mu$ long; basal cell cylindrical, 2–5 $\mu$ long, 4–5 $\mu$ broad; terminal cell very variable, 4–10 $\mu$ broad, cylindrical, clavate, hooked or slightly lobed, with 2–4 blunt, shallow lobes.

Thyriothecia fairly numerous, scattered or in irregular groups, circular in outline or becoming irregular and somewhat angular by mutual contact, 140–180 $\mu$ diam. Basal layer indistinct, hyaline or subhyaline without recognisable structure. Covering membrane slightly convex, buffy brown to olive brown, pellucid, ca. 40 $\mu$ high in the centre, composed of radiating hyphae 2·5–3·5 $\mu$ thick, cells 4–5 $\mu$ long near the centre, up to 7 $\mu$ long near the margin; margin copiously fimbriate, fringing hyphae paler, rather tortuous, remotely septate, 2·5–3 $\mu$ thick and up to 70 $\mu$ long; dehiscing at maturity by stellate fissures running out almost to the margin and dividing the membrane into triangular segments. Asci fairly numerous, 8-spored, globose or broadly ovate, sessile, 28–40 × 28–32 $\mu$, with a firm, thick wall. Spores conglobate, oblong, rounded at both ends, 1-septate, constricted, olive brown, minutely verrucose at maturity, 18–24 × 8–11 $\mu$; cells subequal, or the upper somewhat broader.

Pycnidia similar to the thyriothecia but smaller, 60–90 $\mu$ diam. Conidia ellipsoid, ovate, subclavate or irregular in shape, buffy brown with a lighter medial band, 18–26 × 9–13 $\mu$.

On *Combretum Baumii* Engl. & Gilg., on leaves, Kutue, Angola, *Baum 751*.
*Combretum Kraussii* Hochst., Louis Trichardt, *V. A. Putterill*, 11829; Woodbush, *Doidge*, 1773; Buccleuch, near Cramond, *Sim*, 10152; Springfield, Natal, *Medley Wood*, 9021.
*Combretum glomeruliflorum* Sond., Woodbush, *Doidge*, 17719, 28343; Entabeni, Northern Transvaal, *Wager*, 26371.

*Asterina Combreti* Syd. was originally described from material collected at Kibwezi, British East Africa, on leaves of *Combretum tavatense* (Herb. Sydow and Berlin). It appears to be of common occurrence on Combretum spp. in South Africa, and as pointed out previously (Doidge loc. cit.) is a variable species, the thickness of the hyphae, size of hyphopodia, spores and conidia varying, even on the same leaf, within the limits indicated.

The description of v. Höhnel's species *Asterina kutuensis* conforms with that of the South African collections of *Asterina Combreti* except in one particular: the conidia are said to be 22–32 × 14 $\mu$, i.e. slightly larger than those found in the other collections. In view of the variability of the species, it would appear that the Kutue collection should be regarded as *A. Combreti*.

37. **Asterina Peglerae** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 250, 276. [Plate XLI.]

Colonies amphigenous, more frequently hypophyllous, not on leaf spots, scattered thin, spreading, greyish black, irregular in outline, up to 5 mm. diam., often more numerous near the margin and the base of the leaf.

Mycelium very loosely reticulate. Hyphae slender, honey yellow to isabella colour, more or less undulating, 3·5–4 μ or up to 5 μ thick; cells mostly 20–30 μ long; branching distant and rather irregular. Hyphopodia alternate or unilateral, very rarely opposite, 2-celled, curved or hooked, rarely straight, usually inclined towards the hypha, rarely at right angles to it, 10–18 μ long, 5–6·5 μ, rarely up to 10 μ broad; basal cell usually cylindrical, sometimes gibbous, 3–10 μ long; apical cell very irregular in form, usually asymmetrical, more or less lobed, with 2–3 blunt lobes, often boot-shaped, less frequently uncinate, rarely almost entire and club-shaped.

Thyriothecia scattered, not infrequently in rather close groups of 2–3, round or somewhat irregular in outline, 150–180 μ diam. Basal layer poorly developed, structure not evident. Covering membrane pellucid, honey yellow to yellow ochre; at first slightly convex, composed of irregularly radiating hyphae 3–4 μ thick, with cells 3·5–5 μ long in the centre, up to 7·5 μ long near the margin, which is more or less fimbriate; at maturity becoming more decidedly convex, owing to the formation of mucilaginous matter round the asci; splitting by means of irregular stellate fissures, the central cells falling apart. Asci globose or subglobose, fairly numerous, 8-spored, sessile, thick-walled, 42–52·5 μ diam.; at first with numerous colourless paraphysoids, which break down and form a mucilaginous mass, honey yellow or occasionally orange, in which the asci are embedded at maturity. Spores conglobate, oblong, rounded at both ends, 1-septate, constricted, at first isabella colour, then darker, subopaque at maturity, 25–30 × 12·5–16·5 μ, coarsely and conspicuously echinulate, adorned with spinules up to 2·5 μ long; cells subglobose, the upper larger, 13·75–17·5 μ long and 13·75–16·5 μ broad. Lower cell 11·25–12·5 μ diam.

On *Maerua* sp., on leaves, Kentani, *Pegler 2354*, 9130, Type.

*Maerua pedunculosa* Hochst., Stella Bush, Durban, *Schilz*, 14705; The Wilderness, Cape, *Doidge*, 17124a.

The host of the type collection, No. 9130, was originally identified as probably a *Rhus* sp.; further collections indicate that it is *Maerua* sp.: *Meliola Bosciae*, which occurs only on Capparidaceae, is present on the leaves of 9130, and in the material from the Wilderness, *Asterina Peglerae* is associated on the same leaves with *Meliola Bosciae* and *Cyclotheca Bosciae*; *Maerua pedunculosa* was formerly known as *Boscia caffra*, the latter name being now regarded as a synonym.

38. **Asterina loranthicola** Syd.

Ann. Myc. 12 (1914) p. 266; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 263. [Plate XLII.]

Colonies amphigenous, thin, black, conspicuous, round to irregular in outline, up to 6 mm. diam.; often very numerous, especially on the upper side of the leaf, coalescing to form large, irregular blotches and covering a large part of the leaf surface.

Mycelium reticulate, meshes of network angular. Hyphae buffy brown, straight or somewhat undulating, 4–5 μ, rarely up to 6 μ thick, cells mostly 15–20 μ long, branching irregular. Hyphopodia fairly numerous, alternate or unilateral, mostly 1-celled, usually at right angles to the hyphae or nearly so, 7·5–11 μ long, 5–6 μ broad, cylindrical to ovate, straight to subuncinate; 2-celled hyphopodia rare, up to 14 μ long, with a short, cylindrical basal cell.

Thyriothecia closely crowded, round to irregular in outline, frequently becoming fused laterally and forming larger, irregular, compound ascomata; single thyriothecia 100–160 μ diam.; basal membrane firm, smoke grey to greyish olive, composed of radiating hyphae 2·5–4 μ thick. Covering membrane convex, at first buffy brown, becoming darker, subopaque, composed of radiating hyphae 2·5–4 μ thick, central cells almost cubical, marginal cells longer, up to 7·5 μ long; margin more or less fimbriate; at maturity splitting, by means of irregular stellate fissures, the central cells falling away and exposing the developing asci. Asci ca. 12–15 in each thyriothecium, ovate to globose, sessile, 30–38 × 24–30 μ. Spores oblong, rounded at both ends, 1-septate, constricted, buffy brown, closely and conspicuously echinulate, 20–26 × 8–14 μ; cells subglobose, the upper slightly broader.

Pycnidia numerous, similar to the thyriothecia but smaller, 75–100 μ diam. Conidia ovate to pyriform, buffy brown, with an indistinct, paler medial band, 15–22 × 9–11 μ.

On *Loranthus* sp., on leaves, Quelimane, Mozambique, *Pole Evans* 7385, Type.

*Loranthus Dregei* Eckl. & Zeyh., Kentani, *Pegler 2302*, 8863: Bluff, Durban, *Morgan and Doidge*, 32156.

39. **Asterina polythyria** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 258, 276. [Plate XLIII.]

Colonies amphigenous and caulicolous, mostly epiphyllous, dense black, more or less circular in outline, 1–4 mm. diam., often numerous and becoming confluent.

Mycelium reticulate, becoming very closely interwoven and dense in the centre of the colony, where it is finally almost concealed by the dense groups of thyriothecia and pycnidia. Hyphae deep or dark olive buff to tawny olive, somewhat sinuous, 3·5–4 μ thick, cells mostly 15–20 μ long, branches very numerous, opposite or irregular. Hyphopodia not very numerous, alternate or unilateral, mostly 1-celled, often broader than long, 5–9 μ long, 6–10 μ broad, erect or hooked, mostly 2–3-lobed; many are 3-lobed, symmetrical, and like a trefoil in shape, others are irregular; lobes rounded or retuse; rarely 2-celled, 10–12·5 μ long and 6–7·5 μ broad, with gibbous basal cell.

Thyriothecia very numerous and closely crowded, more or less circular in outline, 150–200 μ diam., rarely solitary, usually fused laterally in groups of 2–4 or many, forming irregular or elongated composite ascomata; in extreme cases, the centre of the colony is an almost continuous mass of thyriothecia and pycnidia, surrounded by a fringe of hyphae. Basal membrane deep olive buff, more or less firmly compacted, radiating in structure, composed of hyphae 2·5–3·5 μ thick. Covering membrane convex, snuff brown, becoming darker, subopaque, firm, composed of radiating hyphae 2·5–3·5 μ thick, central cells almost cubical, 3–5 μ long, margin not fimbriate; splitting at maturity, by stellate fissures, into several triangular segments. Asci fairly numerous, 8-spored, ovate, broadly rounded above, sessile, 27·5–35 × 20–25 μ, with a firm, rather thick wall, somewhat thickened, 2·5–3 μ round the apex; at maturity becoming more elongated, clavate and without apical thickening 37·5–45 × 15–17·5 μ. Spores conglobate, buffy brown, oblong, rounded at both ends, 1-septate, slightly constricted, smooth, 14–17·5 μ long; upper cell broader and more broadly rounded, 7·5–9 μ long and 6–7·5 μ broad, lower 6–7·5 μ long and 5·5–7 μ broad.

Pycnidia very numerous, in groups or interspersed with the thyriothecia, similar to the latter but smaller, 65–120 μ diam. Conidia ovate to pyriform, more rarely oblong, buffy brown with a distinct, subhyaline, medial band, 14–19 × 7·5–11 μ.

On *Osyridicarpus natalensis* A. DC., Tongaat, *van der Byl*, 6949, Type; Langholm Estates, Bathurst, *Doidge*, 12345; Pirie Forest, Kingwilliamstown, *Doidge*, 12326a, 22420.

40. **Asterina clausenicola** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 263, 273. [Plate XLIV.]

Colonies amphigenous, mostly epiphyllous, thin, greyish black, not sharply defined, irregular in outline; at first small, later spreading, becoming confluent and covering the greater part of the upper surface of the leaf.

Mycelium delicate, loosely reticulate, hyphae deep to dark olive buff, 2·5–3·5 μ thick, more or less undulating, rarely straight, cells very variable in length, 15–30 μ long; branches fairly numerous, irregular, sometimes opposite. Hyphopodia alternate or unilateral, rarely opposite, elegant and varied in form; usually 1-celled, 7–11 μ long and 10–14 μ broad, spreading from a narrow base, 3–4-, rarely 5–6 lobed, lobes rounded, truncate, retuse or bilobulate, erect, more or less symmetrical and palmately lobed, or more or less curved and asymmetrical; occasionally 2-celled, 10–17·5 μ long, with basal cell cylindrical and up to 10 μ long, or with the cross wall more or less oblique between two lobes.

Thyriothecia scattered or in small groups, more or less circular in outline, 120–160 μ diam., sometimes confluent or fused in groups of 2–4. Basal membrane smoke grey to greyish olive, firm, composed of radiating hyphae 2–3 μ thick. Covering membrane convex, buffy brown to olive brown, composed of radiating hyphae 2–3 μ thick, cells almost cubical, 2·5–3·5 μ long, or up to 5 μ long; margin usually copiously fimbriate; splitting at maturity, by numerous stellate fissures, into a number of narrow triangular segments. Asci rather numerous, about 20 in each thyriothecium, broadly ovate to subglobose, 4–6-spored, sessile, with a firm, rather thick wall, 27–30 × 22–26 μ; elongating at maturity and becoming narrow ovate, 35–45 × 22–27 μ. Spores conglobate, oblong to subclavate, rounded at both ends, 1-septate, slightly constricted, buffy brown, smooth, 16–20 μ long; upper cell broader and more broadly rounded, 9–10 μ long and 6–9 μ broad, lower 7·5–11 μ long, and 5–7·5 μ broad.

Pycnidia very numerous, scattered or in groups, often interspersed with the thyriothecia similar to the latter but smaller, 60–90 μ diam. Conidia ovate, ellipsoid, subglobose or angular and irregular in form, 12·5–17·5 × 9–13 μ, without lighter medial band, but with 4, rather conspicuous, equatorial germ pores.

On *Clausena anisata* (Willd.) Hk. f. (= *Clausena inaequalis* Bth v. *abyssinica* Engl.) on leaves, Hilton Road, Natal, *Doidge*, 11606, Type; Buccleuch, near Cramond, *Sim*, 10149; Woodbush, *Doidge*, 1754, 17760, 28328.

41. **Asterina erysiphoides** Kalch. et Cke. emend. Doidge.

Kalch. & Cke., Grevillea IX (1880) p. 32, t. 137, fig. 42; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 256–257; Theissen Ann. Myc. 10 (1910) p. 16 and Die Gattung Asterina (1913) p. 25. [Plate XLV.]

Colonies amphigenous, in some collections predominantly hypophyllous, thin, sooty black, round to irregular, up to 6 mm. diam.; often numerous, becoming confluent, covering a large part of the leaf surface, or forming large irregular blotches, which are often along the veins and leaf margins.

Mycelium delicate, radiating, becoming more or less reticulate, especially near the centre of the colony, forming a loose network with rounded or angular mesh. Hyphae tawny olive to snuff brown, slightly undulating or tortuous, 3·5–5 $\mu$ thick, some secondary hyphae thinner, 2·5 $\mu$ thick; branches numerous, usually opposite; cells mostly 15–22·5 $\mu$ long. Hyphopodia alternate or unilateral, rarely opposite, usually 1-celled, erect or hooked, frequently broader than long, 5–10 $\mu$ long, 5–10 $\mu$ broad, usually with 2–5, mostly 3, broad, shallow rounded lobes, asymmetrical and irregular in form; rarely cylindrical, subglobose or clavate and entire or subentire; very rarely 2–3-celled, the septate hyphopodia being usually near the centre of the colony, 10–15 $\mu$ long, with 1 2-celled, cylindrical or slightly gibbous stipe, apical similar in form to the 1-celled hyphopodia and 3·5–7·5 $\mu$ broad.

Thyriothecia scattered or in small confluent groups, rarely 2–3 become completely fused, circular in outline or flattened laterally through contact, 100–130 $\mu$ diam. Basal membrane delicate, olive buff, fairly firm and composed of radiating hyphae 2·5–3 $\mu$ thick. Covering membrane convex, snuff brown, becoming darker and subopaque, firm, composed of radiating hyphae 2·5–3·5 $\mu$ thick, with cells 4–6 $\mu$ long; margin more or less fimbriate, with a fringe of paler, tortuous hyphae; rupturing at maturity, by means of stellate fissures, into a number of narrow, triangular segments. Asci not very numerous, ca. 10–12 in each thyriothecium, embedded in brownish, mucilaginous matter, 8-spored, subglobose or broadly ovate, sessile, with a firm, rather thick wall, 30–37·5 × 26–35 $\mu$. Spores conglobate, oblong, snuff brown, rounded at both ends, 1-septate, constricted, minutely verruculose-echinulate at maturity, 17–25 $\mu$ long; cells subglobose to oval, upper usually broader and more broadly rounded, 11–13 $\mu$ long and 10–12 $\mu$ broad, lower 10–11 $\mu$ long and 7·5–10 $\mu$ broad.

Pycnidia numerous, similar in form to the thyriothecia but smaller, 60–100 $\mu$ diam. Conidia snuff brown, with a somewhat lighter, poorly defined medial band, ovate or pyriform, 16–22 × 10–15 $\mu$.

On *Jasminum tortuosum* Willd., on leaves, Cape, *MacOwan 1139*, Type.

*Jasminum angulare* Vahl., Kentani, *Pegler 1868*, 9161; East London, *Doidge*, 12405; Pirie Forest, Kingwilliamstown, *Doidge*, 12265; Langholm Estates, Bathurst, *Doidge*, 12352; Alexandria, *Doidge*, 22367.

*Jasminum multipartitum* Hochst., Alice, *Doidge*, 10978; Springfield, Natal, *Medley Wood*, 9018; East London, *Doidge*, 12432; Tongaat, *van der Byl*, 6954.

No. 12432 differs slightly from the other collections, the hyphopodia are more deeply lobed and the proportion of 2-celled hyphopodia is larger.

*Asterina erysiphoides* Kalch. & Cke. (not Ell. & Mart) was described in Grevillea IX (1880) p. 32, the type collection being *MacOwan 1139* on *Jasminum tortuosum*. In the Annales, Mycologici 10 (1912) p. 16, Theissen states that there are three collections under this name in the Kew Herbarium: the type collection *MacOwan 1139*, a second with the designation *Puccinia exhauriens* Thüm., and a third on *Barosma scoparia*, *MacOwan 1260*, from Grahamstown, the last being an immature Meliola. The type consists of an immature Asterina with light brown mycelium, of which the hyphae are 4–5 $\mu$ thick, and bear alternate hyphopodia 6–8 $\mu$ long and mostly 3-lobed. The immature thyriothecia have no asci, only brown stylospores with hyaline band, 18–22 $\mu$ long and 10–12 $\mu$ broad ("sporidiis ellipticis, continuis, atro-fuscis, 18–20 × 10 $\mu$" in the original diagnosis). Theissen concludes that the species should be ignored ("Die art is zu streichen").

There has evidently been some confusion in the labelling of MacOwan's collections. The collection labelled *MacOwan 1139* in the herbarium of the South African Museum, Capetown is *Puccinia exhauriens*, and no trace of an Asterina could be found on this material. *MacOwan 1260* is *Meliola microthecia* Thüm. on *Barosma scoparia* (Bothalia II, 1928, p. 454).

The type collection at Kew, *MacOwan 1139*, is evidently the Asterostomella-stage of a species of Asterina which occurs fairly commonly in Natal and the Eastern Cape. A number of collections agree with the description of the mycelium and pycnidia made by Theissen from the Kew specimen and with the original description in Grevillea; several numbers show well developed thyriothecia, which were described by Doidge (loc. cit.). The name *Asterina erysiphoides* Kalch. & Cke. emend. Doidge should be retained for this fungus, which is evidently the species collected by MacOwan and described in Grevillea.

In Stevens and Ryan, The Microthyriaceae (1939) p. 24, *Asterina erysiphoides* K. & Cke. is given as a synonym for *Seynesia microthyrioides* (Wint.) Theiss., a fungus with no free mycelium occurring on Eucalyptus in Australia; for this there appears to be no justification.

42. **Asterina tertia** Rac., var. **africana** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 264, 277. [Plate XLVI.]

Colonies epiphyllous, numerous, thin, black, circular, up to 3 mm. diam., often numerous and tending to become confluent. Mycelium very loosely reticulate. Hyphae isabella colour to tawny olive, more or less deeply and regularly undulating, 3–4 $\mu$ thick, rarely up to 5 $\mu$; cells mostly 20–30 $\mu$ long; branching irregular, sometimes opposite. Hyphopodia fairly numerous, unilateral or alternate, rarely opposite, mostly 1-celled, irregularly lobed, 5–10 $\mu$ long, 6–12·5 $\mu$ broad, erect or hooked, with 2–5 irregular, rounded or retuse lobes, lobes rarely symmetrical; occasionally 2-celled with gibbous stipe, 10–12·5 $\mu$ long and 5–6·5 $\mu$ broad.

Thyriothecia very numerous, crowded, irregularly circular or oval in outline, 100–140 $\mu$ diam., rarely solitary, usually fused in groups of 2–5 or many, and forming larger, compound ascomata. Basal membrane olive buff to deep olive buff, formed of radiating hyphae 2–3 $\mu$ thick, delicate, not firmly compacted and readily falling apart under pressure. Covering membrane at first pellucid, isabella colour to tawny olive, slightly convex, becoming darker, subopaque and more definitely convex at maturity, composed of radiating hyphae 2·5–3 $\mu$ thick, cells 3·5–5 $\mu$ long; margin not fimbriate or rather sparsely so; at maturity breaking into a number of triangular segments through the formation of radiating stellate fissures, which run out almost to the margin. Asci very numerous, 20–30 or more in each thyriothecium, 8-spored, broadly ovate, subsessile, 30–35 × 27·5–30 $\mu$, embedded in an ochraceous mass of mucilaginous matter. Spores oblong, isabella colour to tawny olive, pellucid, 1-septate, constricted, broadly rounded at both ends, 16–18 × 7·5–10 $\mu$, rarely exceeding 9 $\mu$ in breadth; cells subglobose, equal in size, or the upper very slightly broader; minutely but very distinctly verruculose at maturity.

Pycnidia similar to the thyriothecia but smaller, 50–80 $\mu$ diam., Conidia ovate to pyriform, tawny olive, without paler medial band, less frequently oblong to globose, 11–18 × 10–13 $\mu$.

On *Hypoestes aristata* R. Br., on leaves, Inanda, *Medley Wood 608*, 9512; East London, *Doidge*, 10923.

*Hypoestes verticillaris* R. Br., Claridge, *Doidge*, 8998; Kentani, *Pegler 2317*, 9074 Van Staden's Pass, *Doidge*, 10856; Langholm Estates, Bathurst, *Doidge*, 12356; Entumeni, Zululand, *Haygarth*, 14149; Caradoc's Bush, Knysna, *Bottomley*, 32207.

*Barleria obtusa* Nees, Winkle Spruit, *Franks*, 9538.

*Dicliptera clinopodia* Nees, Lemana, Northern Transvaal, *Doidge*, 1791, Type; Pirie Forest, Kingwilliamstown, *Doidge*, 12270.

*Dicliptera heterostegia* Nees, Mayville, Durban, *Medley Wood*, 9028.

43. **Asterina diplocarpa** Cke.

Grevillea 10 (1882) p. 129; Theissen, Die Gattung Asterina (1913) p. 106; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 263.

Syn.: *Asterina similis* Cke., Grevillea 10 (1882) p. 130.

*Seynesia Balansae* Speg. var. *africana* Sacc., Hedwigia 38 (1899) p. (133); Syll. Fung. XVI, p. 649.

*Asterina Balansae* (Speg.) Theiss. var. *africana* (Sacc.) Th., Die Gattung Asterina (1913) p. 88; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 257. [Plate XLVII.]

Colonies amphigenous, mostly epiphyllous, black, more or less circular, up to ca. 2·5 mm. diam.; usually very numerous on the upper side of the leaf, becoming confluent and covering the whole leaf surface.

*Mycelium more or less reticulate*; very closely reticulate and interwoven in the neighbourhood of the thyriothecia; meshes more or less rounded. Hyphae vinaceous buff to avellanous or wood brown, deeply and rather regularly undulating, in places giving a zig-zag effect, 3·5–4 $\mu$ thick, rarely up to 5 $\mu$; cells mostly 15–25 $\mu$ long; branches numerous, usually alternate. Hyphopodia fairly numerous, 1-celled, alternate or unilateral, 5–7·5 $\mu$ long and 7–10 $\mu$ broad, irregularly lobed; the majority more or less erect and symmetrical, with 2–3 truncate, rounded or bilobulate lobes; the remainder hooked, with 2–4 rounded lobes on the convex side.

Thyriothecia very numerous, crowded, rarely discrete, more or less circular in outline, 100–150 $\mu$ diam.; mostly confluent or completely fused in groups of 2–4 or many, and forming irregular, compound ascomata. Basal membrane subhyaline to pale smoke grey, delicate, composed of radiating hyphae, which are loosely compacted and not always readily detected. Covering membrane convex, at first avellanous to wood brown, pellucid, becoming darker and subopaque, formed of radiating hyphae 2·5–3 $\mu$ thick, central cells 3–5 $\mu$ long, those near the margin longer; margin not fimbriate or rather sparsely so; splitting at maturity, by radiating fissures, into a number of narrow, triangular segments. Asci rather numerous, 20–30 in each thyriothecium, 8-spored, ovate or subglobose, subsessile, 34–42 × 25–27·5 $\mu$, with a firm, rather thick wall slightly thickened, 1·5–6 $\mu$, round the apex. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, deeply constricted, avellanous to wood brown, closely and minutely verruculose, 15–16·5 $\mu$ long; upper cell subglobose, slightly broader, 7·5–9 $\mu$ diam., lower usually 7·5–8 $\mu$ broad.

Pycnidia numerous, similar to the thyriothecia but smaller, 70–90 $\mu$ diam. Conidia continuous, ovate or subglobose, wood brown without lighter medial band, 13·5–19 × 12–14 $\mu$.

On *Sida rhombifolia* L., on leaves, Inanda, *Medley Wood 544*, 9505, 10192, (Type of *Asterina similis* Cke.).

*Sida cordifolia* L., Inanda, *Medley Wood 601*, Type, 9506, 10194; Van Staden's Pass, *Doidge*, 10858; Natal, *Medley Wood 6161*, 9507 (Type of *Seynesia Balansae* Speg. var. *africana* Sacc.); Durban, *van der Byl 739*.

The basal membrane of the thyriothecium is delicate in structure or composed of loosely radiating hyphae; no very compact membrane could be detected in the type or in the other collections examined. *Medley Wood 6161* is not on *Rubus rigidus*, as stated by Saccardo (loc. cit.) but on *Sida cordifolia*, and agrees in every way with *Asterina diplocarpa* Cke.: in Theissen's monograph (loc. cit.) this collection is named *Asterina Balansae* Speg. var. *africana* and is included in the section Clypeolaster, "without basal membrane"; *Asterina diplocarpa* is placed in the section Clypeolaster, comprising species with basal membrane. The basal membrane in this species is delicate and loosely compacted, and it may probably be regarded as a transition form between the two sections.

43a. **Asterina diplocarpa** Cke. var. **Hibisci** Doidge nov. var.

Sub *Asterina diplocarpa* Cke., Trans. Roy. Soc. S. Afr. 8 (1920) p. 263.

Mycelium delicate, radiating irregularly, later becoming loosely reticulate with rounded meshes. Hyphae 2·5–3·5 $\mu$ thick, rarely up to 4 $\mu$, more or less deeply undulating; cells mostly 15–20 $\mu$ long; branches fairly numerous, alternate or opposite. Hyphopodia few, distant, alternate or unilateral, 5–11·5 $\mu$ long, 7·5–15 $\mu$ broad. Thyriothecia 100–130 $\mu$ diam. Asci not very numerous, ca. 10–12 in each thyriothecium, subglobose or broadly ovate, 25–33 × 22·5–25 $\mu$. Spores 17–20 $\mu$ long; cells subequal in length, upper slightly broader, 9–10 $\mu$ broad, lower 7·5–9 $\mu$, minutely verruculose.

Pycnidia numerous, 70–80 $\mu$ diam. Conidia 16–18 × 13–15 $\mu$. In other respects like the type.

On *Hibiscus pedunculatus* Cav., on leaves, Town Bush Valley, Pietermaritzburg, *Doidge*, 9710; East London, *Doidge*, 10927; Duncairn, near Pietermaritzburg, *Doidge*, 14952; Van Staden's Pass, *Doidge*, 17258, Type; Deepwalls, Knysna, *Bottomley*, 32126.

44. **Asterina Excoecariae** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 258, 274. **[Plate XLVIII.]**

Colonies amphigenous, thin, greyish black, poorly defined and irregular in outline, up to 8 mm. diam.

Mycelium delicate, reticulate, with angular meshes. Hyphae deep olive buff or avellanous to wood brown, 3·5–5 $\mu$ thick, straight or slightly undulating; cells mostly

16–20 μ long ; branches fairly numerous, usually opposite and at an angle of about 45° with the main hypha. Hyphopodia fairly numerous, unilateral or alternate, 1-celled, mostly erect, occasionally hooked, irregular in form, often broader than long, mostly 5–7 μ long, rarely up to 9 μ or 11 μ ; 5–10 μ, mostly 6–8 μ broad ; mostly 2–3-lobed, with very shallow, broadly rounded lobes, occasionally more deeply lobed, rarely entire or subentire, obovate or bolster-shaped.

Thyriothecia scattered or more or less crowded, often confluent in groups of 2–3, round to irregular in outline, 150–200 μ diam. Basal membrane delicate, pale smoke grey, composed of radiating, loosely compacted hyphae, ca. 3–3·5 μ thick. Covering membrane slightly convex, pellucid, deep to dark olive buff, becoming darker, subopaque, composed of irregularly radiating hyphae 2·5–3 μ thick, which become tortuous near the margin ; central cells almost cubical, 3–4 μ long, cells near the margin indistinctly septate and irregular in length ; margin irregular but not fimbriate ; splitting at maturity, by means of stellate fissures, into a number of triangular segments. Asci not very numerous, about 10·12 in each thyriothecium, 4-spored, broadly ovate to subglobose, sessile, with a firm, rather thick wall, 37–45 × 31–42·5 μ. Spores conglobate, wood brown, oblong, broadly rounded at both ends, 1-septate, constricted, finely and closely verruculose-echinulate, 25–30 × 12–14 μ ; cells subequal, or the upper broader and more broadly rounded.

Pycnidia numerous, similar to the thyriothecia but smaller, 60–90 μ diam. Conidia mostly ovate, less frequently subglobose or ellipsoid, buffy brown to olive brown, with or without an indistinct, lighter, medial band, 17·5–25 × 15–20 μ, thick-walled, wall ca. 1·5 μ thick.

On *Drypetes arguta* Hutch., on leaves, Winkle Spruit, Natal, *Doidge*, 9009, Type.

This is another species of which the host plant was incorrectly named.

45. **Asterina Fleuryae** Doidge nov. spec. [Plate XLIX.]

Colonies epiphyllous, not producing leaf spots, minute, 1–2·5 mm. diam., inconspicuous and poorly defined, black, often numerous, becoming confluent and forming larger irregular blotches.

Mycelium loosely reticulate. Hyphae pellucid, olive buff to buffy brown, 3–4·5 μ thick, rather thin-walled, deeply undulating ; cells mostly 20–25 μ long ; branching irregular. Hyphopodia 2-celled, not numerous, alternate or unilateral, rarely opposite, straight, curved, hooked or uncinate, 9–19 μ long, more frequently erect than inclined towards the hyphae ; basal cell cylindrical, straight or curved, 1·5–10 μ long, 3–4 μ thick, or gibbous and up to 7 μ thick ; apical cell straight, uncinate, hooked or undulating, cylindrical, 3–4 μ thick, or irregularly 2–4-lobed, with rounded, rather shallow lobes, and up to 10 μ broad.

Thyriothecia fairly numerous, scattered or in groups ; groups of 2–4 or more, which are in contact, often fuse laterally, forming larger, irregular, compound ascomata ; single thyriothecia round to irregular in outline, 100–130 μ diam. Basal membrane smoke grey, fairly firm, radiating in structure, composed of radiating hyphae, 2·5–3·5 μ thick. Covering membrane at first concolorous with the hyphae, becoming dark olive brown, subopaque, convex, formed of radiating hyphae 3–3·5 μ thick, with cells 3·5–5 μ long near the centre, longer, up to 8 μ, near the margin ; margin more or less fimbriate, fringing hyphae 2·5–3·5 μ thick, curved, tortuous ; splitting at maturity, by means of stellate fissures, into a number of triangular segments. Asci fairly numerous, 8-spored, embedded in indistinctly fibrose, greyish brown, mucilaginous matter, ovate or subglobose, sessile, with a firm, rather thick wall, 25–35 × 17–20 μ. Spores conglobate, oblong, dark olive buff, rounded at both ends, 1-septate, somewhat constricted, smooth, 12–15 × 5–6·5 μ ; cells subequal or the upper slightly broader, both cells broadly oval, or the upper subglobose, shorter and broader than the lower, which is oblong.

Pycnidia numerous, similar to the thyriothecia but smaller, 60–90 μ diam. Conidia olive brown, with a poorly defined, lighter medial band, ovate, ellipsoid or pyriform, 11–16 × 6·5–9 μ.

On *Fleurya* sp., on leaves, Woodbush, *Doidge*, 28349, Type.

46. **Asterina van der Bylii** Werd.

Rep. sp. nov. regni. veg. 19 (1923) p. 49. [Plate L. ]

Colonies amphigenous, not on leaf spots, more numerous on the upper side of the leaf, thin, black, scattered, round to irregular in outline, 2–4 mm. diam. ; often numerous,

becoming confluent, covering the whole upper surface of the leaf, and becoming continuous round the margin on the under side.

Mycelium more or less closely reticulate. Hyphae straight or very slightly undulating, 3·5–5 μ thick; younger hyphae drab grey, darkening with age to snuff brown; cells varying from 15–45 μ in length; branches opposite or alternate, usually at an acute angle with the main hyphae. Hyphopodia alternate, unilateral or opposite, 2-celled, rarely 1-celled, fairly numerous, 10–20 μ long; basal cell cylindrical, 3–10 μ long, 4–5 μ thick; apical cell 5–10 μ long, 5–9 μ broad, cylindrical or clavate, straight, hooked or more or less curved, entire or sublobed.

Thyriothecia comparatively rare and often absent, round or rather irregular in outline, 130–160 μ diam. Basal membrane pale smoke grey to light greyish olive, radiating, delicate but firmly compacted. Covering membrane slightly convex, at first snuff brown, becoming darker and subopaque, composed of radiating hyphae 2·5–3 μ thick, cells 4–5 μ long, or less frequently up to 7·5 μ long; margin briefly fimbriate, fringing hyphae paler, tortuous, 3–4 μ thick. Asci 8-spored, ovate, subsessile, 30–35 × 26–28 μ. Spores conglobate, oblong, rounded at both ends, 1-septate, rather deeply constricted, snuff brown, very minutely verruculose, 17·5–20 × 9–11 μ; cells subglobose, upper slightly larger.

Pycnidia formed in great profusion, 50–75 μ diam., similar to the thyriothecia. Conidia ellipsoid to subclavate, snuff brown with an indistinct, lighter medial band, 17·5–20 × 9–10 μ.

On *Heteropyxis natalensis* Harv., on leaves, Krantzkloof, Natal, *van der Byl 398*, Type; Umzimkulu Gorge, Oribi Flats, near Port Shepstone, *McClean 551*, 31288; Springfield, Natal, *Medley Wood*, 9022; Krantzkloof, *Doidge*, 8254; Barclayvale, *Liebenberg*, 30459; south bank of the Sabie River, *Mogg*, 32230; Zimbabwe, S. Rhodesia, *van der Byl 2470*.

Werdermann gives the measurements of the ascospores as 15–17·5 × 5–8 μ; it is possible that the material he examined was immature, as he also states that the spores are smooth.

*Heteropyxis ruto-rhamnoides*, stated to be the host of *van der Byl 2470*, is identical with *H. natalensis*; the latter is a very variable species and the name *H. ruto-rhamnoides* was given to one of its numerous forms, but the name was not published.

47. **Asterina peraffinis** Speg.

Fung. Puigg. 355 (1889); Sacc. Syll. Fung. IX, p. 392; Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 259.

Syn.: *Asterina pseudopelliculosa* Speg. var. *peraffinis* (Speg.) Th. Die Gattung Asterina (1913) p. 104. **[Plate LI.]**

Colonies amphigenous, not on leaf spots, thin, greyish black, round to irregular in outline, up to 7·5 μ diam., often becoming confluent; becoming more conspicuous after the formation of numerous thyriothecia, which appear as a thick powdering of black on the greyish spots.

Mycelium more or less reticulate. Hyphae deep to dark olive buff, older hyphae occasionally buffy brown, pellucid, straight or slightly undulating, 3–5 μ thick; branching irregular. Hyphopodia not very numerous, alternate or unilateral, 2-celled, only occasionally 1-celled, straight or more or less curved, at various angles with the hypha or closely appressed towards it, 10–20 × 8–12·5 μ, irregularly, often palmately 3–4-lobed, lobes rounded or truncate; often obliquely septate between the first and second lobes and thus forming a gibbous basal cell; basal cell rarely cylindrical.

Thyriothecia very numerous and thickly scattered, small groups of 2–4 often closely crowded and becoming more or less connate, round, brown, 120–160 μ diam. Basal membrane firm, olive buff to deep olive buff, composed of radiating hyphae 2·5–4 μ thick. Covering membrane convex, up to 75 μ high in the centre, at first deep olive buff, then buffy brown to olive brown, pellucid, rather loosely compacted of straight, radiating hyphae, 2·5–4 μ thick, central cells almost cubical, 2·5–4 μ long, peripheral cells somewhat longer, 5–8 μ long; early becoming split into a number of triangular segments by means of irregularly stellate fissures, which reach almost to the margin; margin fimbriate, fringing hyphae paler, 3–4 μ thick, almost straight or more or less tortuous and up to 25 μ long. Asci embedded in olive ochre mucilaginous matter, ovate, subglobose or broadly ellipsoid, 8-spored, sessile, thin-walled, somewhat thickened, up to 3 μ, round the apex, 30–40 × 22·5–30 μ; fairly numerous, up to 12, in each thyriothecium. Spores conglobate, pellucid, buffy brown to olive brown, oblong, broadly rounded at both ends, 1-septate, constricted, smooth, 17·5–20 μ long; cells subglobose to broadly ellipsoid, upper larger, 10–12·5 μ long and 8·5–10 μ broad, lower 7·5–8·5 μ long and 6–7·5 μ broad.

Pycnidia numerous, similar to the thyriothecia but smaller, about 70 μ diam. Conidia ovate to pyriform, dark olive buff, continuous, without a hyaline band, 17–20 × 6–10 μ.

On *Tylophora Flanagani* Schlecht., on leaves, Lemana, Northern Transvaal, *Doidge*, 1804; Brander's High Forest, Victoria East, *van der Byl*, 9458; Pirie Forest, Kingwilliams, town, *Doidge*, 12304; Hoek van Helbosch, N. Transvaal, *Burtt Davy*, 15498; West Wood, Haenertsburg, *Doidge*, 17721; Woodbush, *Doidge*, 28345 and *van der Byl 1653*.

48. **Asterina radio-fissilis** (Sacc.) Theiss.

Ann. Myc. 10 (1912) p. 22; Die Gattung Asterina (1913) p. 97.

Syn.: *Dimerium radio fissilis* Sacc., Fungi aliquot afr., Bol. Soc. Brot. 21 (1904) p. 21.
*Asterina natalensis* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 248, 275.

Sub *Asterina tenuis* Wint., in Trans. Roy. Soc. S. Afr. 8 (1920) p. 250. [Plate LII.]

Colonies amphigenous, mostly epiphyllous, not on leaf spots, black, small, circular to irregular in outline, up to 2 mm. diam., often becoming confluent and forming larger, irregular blotches.

Mycelium loosely reticulate, composed of undulating hyphae, which are dark olive buff to buffy brown, 3·5–4 μ thick, with cells mostly 15–25 μ long; branching irregular. Hyphopodia fairly numerous, alternate or unilateral, rarely opposite, mostly 2-celled, rarely continuous, 10–15 μ long, occasionally up to 20 μ, 6–10 μ broad, straight, curved or hooked; basal cell cylindrical or gibbous, 2–5 μ long, 3·5–4·5 μ thick, rarely up to 6 μ thick; apical cell irregular in shape, usually with 2–4 blunt lobes, rarely subentire and club-shaped.

Thyriothecia numerous, often crowded, round to irregular in outline, or becoming angular when two or more contiguous thyriothecia become fused, 100–140 μ diam. Basal membrane smoke grey to greyish olive, radiating in structure, formed of hyphae about 2·5 μ thick. Covering membrane slightly convex, buffy brown to olive brown, often subopaque, formed of radiating hyphae 2–3 μ thick, cells 3–5 μ long; margin not fimbriate or sparsely so; splitting at maturity into a number of triangular segments, by means of stellate fissures which run out almost to the margin. Asci fairly numerous, ovate, sessile, 8-spored, 27·5–32·5 × 23–25 μ. Spores conglobate, buffy brown, oblong, 1-septate, slightly constricted, minutely verruculose, 15–19 × 7–9 μ; cells subequal.

Pycnidia similar to the thyriothecia but smaller, 60–80 μ diam. Conidia ellipsoid to ovate, buffy brown with a lighter medial band, 11–15 × 7–9 μ.

On *Erythrococca berberidea* Prain, on leaves, near Durban, *Medley Wood 6458b*, 9524b.
*Ctenomeria capensis* (Thunb.) Harv., Winkle Spruit, *Doidge*, 9001 (Type of *Asterina natalensis*); van Staden's Pass, *Doidge*, 17259.
*Dalechampia capensis* Spreng., Amanzimtoti, *Doidge*, 1638; Winkle Spruit, *Doidge*, 9003.
*Acalypha decumbens* Thunb., van Staden's Pass, *Doidge*, 10862

According to Theissen (loc. cit.) the type of *Asterina radio-fissilis* is *Medley Wood 6452*, on *Kraussia coriacea*; it has lobulate hyphopodia and spores 17–19 × 8–10 μ; var. *macrospora*, *Medley Wood 6458*, on leaves of an unknown tree, has spores 25–28 × 11–13 μ. Both these collections of Medley Wood are to be found under the name *Asterina tenuis* in various herbaria.

The material distributed under the numbers quoted evidently consists of a mixture of leaves from different hosts. The portion of *Medley Wood 6452* in the herbarium at Pretoria is certainly *Kraussia coriacea*, but the fungus on these leaves has node cells and not typical hyphopodia (see *Asterolibertia megathyria*), and is certainly not the Asterina described by Theissen. Under *Medley Wood 6458* are included leaves of two entirely different plants; one is a *Capparis* sp. (see *Asterina Woodii*) and the other is *Erythrococca berberidea*. The latter host was erroneously recorded as *Claoxylon* sp. in a previous paper (Doidge l.c.) and Theissen's reference to Medley Wood's collection was unfortunately overlooked.

There can be no doubt, from Theissen's description and drawings, that *Asterina radio-fissilis* is the fungus on Erythrococca, the fungus on Capparis being an Asterina with entire, cylindrical and usually uncinate hyphopodia. *A. radio-fissilis* cannot be distinguished from *A. natalensis* Doidge, and the latter must be regarded as a synonym; the host of the type collection of the latter fungus is not *Mikania* sp., as originally stated, but *Ctenomeria capensis*. The fungus on Acalypha is identical with collections of *A. radio-fissilis* on other hosts, and not with the related species *Asterina Acalyphae* Syd.

49. **Asterina africana** (van der Byl) Doidge nov. comb.

Syn.: *Asterina celtidicola* P. Henn. v. *microspora* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 260.

*Parasterina africana* vand er Byl, S. Afr. Jour. Sci. 26 (1929) p. 319. [Plate LIII.]

Amphigenous, forming very numerous, small, indefinite, greyish black spots, which frequently cover a large part of the leaf surface ; most numerous along the veins and under the margin of the leaf.

Mycelium more or less closely reticulate. Hyphae straight or more or less undulating, pellucid, tawny olive to snuff brown, 3–5 $\mu$ thick, rather indistinctly septate, branching irregular. Hyphopodia alternate, 2-celled, occasionally 1- or 3-celled, slightly curved, uncinate or bent abruptly at right angles (boot-shaped), rarely straight and club-shaped, entire or with 2–3 short, rounded or truncate lobes, 10–17·5 $\mu$ long and 4–10 $\mu$ broad ; basal cell more or less cylindrical, 4–7·5 $\mu$ long.

Thyriothecia numerous, thickly scattered, not infrequently in contact with one another and becoming connate in large or small groups, circular, slightly elongated or somewhat angular in outline, 100–150 $\mu$ diam. Basal membrane not conspicuous, delicate, subhyaline to dark olive buff, formed of rather loosely compacted, radiating hyphae, ca. 3 $\mu$ thick. Covering membrane convex, tawny olive then snuff brown, becoming subopaque, composed of straight, radiating hyphae 2·5–3·5 $\mu$ thick, cells 5–7·5 $\mu$ long ; early splitting into narrow triangular segments through the formation of radiating stellate fissures ; margin not fimbriate or sparsely so, a few hyphae being prolonged into paler, tortuous hyphae up to about 60 $\mu$ long. Asci numerous, up to 30 in each thyriothecium, broadly ovate to subglobose, sessile, 8-spored, 26–33 × 22–30 $\mu$. Spores conglobate, tawny olive to snuff brown, oblong, broadly rounded at both ends, 1-septate, constricted, closely and rather conspicuously verruculose-echinulate, 16–20 $\mu$ long ; cells of approximately equal length, subglobose to broadly ellipsoid, upper usually broader, 8–10 $\mu$ broad, lower 7·5–9 $\mu$.

Pycnidia closely associated with the thyriothecia and similar in form but smaller, 60–100 $\mu$ diam. Conidia oblong or ovate, continuous, snuff brown with a hyaline, medial band, 14–20 × 8–12·5 $\mu$.

On *Xylotheca Kraussiana* Hochst., Durban, *H. Forbes* (*van der Byl 2527*), Type ; Stella Bush, Durban, *Bottomley*, 11376, 11382, 11378 ; Stella Bush, *van der Byl 742*, 11361 and *Schilz* 14706 ; Durban, *Bottomley* 11897, 11898, *Pole Evans* 11899 and *Franks* 8405 ; Durban, *van der Byl 110* ; Winkle Spruit, *Doidge*, 9004, 9012 ; Amanzimtoti, *Doidge*, 1683 ; Berea, Durban, *Morgan and Doidge*, 32157.

*Oncoba* sp., Rikatli, Mozambique, *Junod*, 11731, 11732.

In a previous paper (Doidge, loc. cit.) this fungus was described as *Asterina celtidicola* var. *microspora* on *Maerua* (3 numbers) and *Oncoba Kraussiana* (2 numbers) ; the host in each case is *Xylotheca Kraussiana* Hochst., for which *Oncoba Kraussiana* is a synonym. *Parasterina africana* van der Byl was said to be on *Cola natalensis*, but the host of the type specimen is not this plant but *Xylotheca Kraussiana*.

*Asterina africana* has a distinct basal membrane to the thyriothecia and differs from *Asterina celtidicola* in a number of other particulars.

49*a*. **Asterina africana** (van der Byl) Doidge var. **Kiggelariae** Doidge nov. var.

Sub *Asterina celtidicola* P. Henn. var. *microspora* Doidge in Bothalia I (1924) p. 204.

Colonies always epiphyllous. Mycelium composed of radiating, irregularly branched hyphae, which become loosely reticulate ; rather closely reticulate near the centre of the colony, where there is a tendency for two or more hyphae to run parallel and become connate. Hyphae and hyphopodia similar to those of the type ; hyphopodia occasionally opposite, 8–20 $\mu$ long, 6–9 $\mu$ broad ; basal cell more or less cylindrical, rarely gibbous, 3–12·5 $\mu$ long and 3–5 $\mu$ thick ; terminal cell as in the type.

Basal membrane of thyriothecia subhyaline, delicate, readily breaking down and difficult to detect ; covering membrane consisting of straight, radiating hyphae 2–3 $\mu$ thick, cells ca. 4–5 $\mu$ long in the centre, slightly longer near the sparsely fimbriate margin. Asci not very numerous, 6–12 in each thyriothecium, 27·5–35 × 25–32·5 $\mu$. Spores slightly broader than those of the type, upper cell 8·5–11 $\mu$ broad, very minutely verruculose at maturity.

Conidia somewhat smaller than those of the type, 10–17·5 × 8·5–11·5 $\mu$.

On *Kiggelaria africana* L., on leaves, Keurkloof Forest, George, *Doidge*, 17111, Type ; Storm's River, Humansdorp District, *Doidge*, 17191 ; Deepwalls, Knysna, *Doidge*, 17221 ; Woodbush, *Doidge*, 17748 ; Montagu Pass Road, George, *Doidge*, 17104.

50. **Asterina elegans** Doidge nov. spec.

Sub *Asterina sphaerasca* Thüm., in Trans. Roy. Soc. S. Afr. 8 (1920) p. 262. [Plate LIV.]

Colonies mostly epiphyllous, black, often circular in outline and up to 5 mm. diam., sometimes confluent and covering larger areas of the leaf surface.

Mycelium reticulate. Hyphae tawny olive to cinnamon brown, the primary hyphae finally becoming subopaque, straight or slightly undulating, 3–6 μ thick, cells 20–35 μ long, branching irregular. Hyphopodia numerous, opposite, alternate or unilateral, occasionally three arise from one hyphal cell and are in a whorl or placed irregularly, at right angles to the hypha or inclined towards it, 2-celled, cylindrical, straight or slightly curved, 12–20 μ long, 4–6 μ broad; basal cell cylindrical, 5–7·5 μ long; terminal cell cylindrical, tapering somewhat to the rounded apex, or constricted near the apex.

Thyriothecia numerous, thickly scattered, more or less circular in outline, 130–170 μ diam.; basal membrane pale smoke grey to deep olive buff, composed of radiating hyphae 3–5 μ diam.; covering membrane convex, cinnamon brown to russet, becoming opaque in the centre, composed of straight, radiating hyphae 3–4 μ thick, cells 3·5–4 μ long in the centre, somewhat longer near the fimbriate margin; splitting at maturity, by stellate fissures, into numerous narrow, triangular segments. Asci not numerous, subglobose to ovate, sessile, 8-spored, thick-walled, especially when immature, 45–50 × 35–42 μ. Spores conglobate, cinnamon brown when mature, oblong, broadly rounded at both ends, 1-septate, constricted, 22–25 μ long; cells approximately equal in length, ellipsoid to subglobose, upper 11–12·5 μ broad, lower 9–10·5 μ broad; very coarsely and conspicuously verruculose-echinulate at maturity, with spinules up to 1·5 μ long.

Pycnidia similar to the thyriothecia but smaller, 100–120 μ diam. Conidia ovate, tawny olive to cinnamon, without hyaline band, 20–25 × 12–15 μ.

On *Capparis citrifolia* Lam., on leaves, Winkle Spruit, *Doidge*, 9010, Type.
*Capparis Gueinzii* Sond., Bluff, Durban, *Morgan and Doidge*, 32155.

51. **Asterina capparidicola** Doidge nov. spec. [Plate LV.]

Colonies amphigenous, but more numerous and better developed on the upper side of the leaf, numerous, black, at first minute, 1–3 cm. diam., round to irregular, more or less scattered; later becoming confluent and forming irregular blotches, which cover a large part of the leaf surface; rarely there are discrete, irregularly circular colonies up to 5 mm. diam.; occasionally caulicolous.

Mycelium closely reticulate. Hyphae almost straight or somewhat undulating, about 5 μ thick, closely articulated, tawny olive to snuff brown, copiously branched, two or more hyphae often running parallel and becoming connate, frequently forming, with the hyphopodia, especially near the centre of the colony, an almost continuous, compact mycellial layer. Hyphopodia very numerous, ususlly opposite, at right angles to the hypha or inclined towards it, 2-celled, straight, somewhat curved or abruptly bent, ovate or briefly clavate, 10–15 μ long and 5·5–7·5 μ broad; basal cell cylindrical, ca. 5 μ thick, usually 2–3 μ long, but sometimes up to 6 μ; apical cell subglobose or briefly cylindrical, broadly rounded at the apex.

Thyriothecia thickly scattered and usually associated with numerous pycnidia, more or less circular in outline, 110–140 μ diam., often coalescing in groups of 2–8. Basal membrane smoke grey to deep olive buff, composed of radiating hyphae 2–3·5 μ thick. Covering membrane convex, up to 40 μ high in the centre, composed of straight or slightly undulating, radiating hyphae 3–4 μ thick, with cells 2–4 μ long, almost cubical, but near the centre broader than long; margin fimbriate with a fringe of tortuous, paler hyphae 3·5–4 μ thick and up to 150 μ long, or, in the denser parts of the mycelium, not fimbriate; pellucid, at first snuff brown to bistre, later becoming almost black, opaque; early breaking into rather broad, irregular, triangular segments, through the formation of stellate cracks, often breaking away in the centre and exposing the asci. Asci globose or broadly ovate, sessile, 8-spored, 32–43 × 27·5–37·5 μ. Spores conglobate, dark olive buff to tawny olive, oblong, broadly rounded at both ends, constricted at the septum, 22–27·5 μ long; upper cell larger, 12·5–15 μ long and 11·5–13·5 μ broad, lower 10–12·5 μ long and 10–11·5 μ broad; minutely and evenly, or rather conspicuously verruculose-echinulate at maturity.

Pycnidia similar to the thyriothecia but smaller, up to 100 μ diam. Conidia tawny olive to snuff brown, with or without an indistinct, lighter medial band, ovate to oblong, 17–25 × 12–15 μ.

On *Capparis Zeyheri* Turcz., on leaves and stems, Alexandria, *Doidge*, 22360, 22361 Type ; Van Staden's Pass, *Doidge*, 17254.

*Capparis citrifolia* Lam., Ebb and Flow, Wilderness, *Doidge*, East London, *Doidge*, 12416.

*Capparis ?volkameriae*, Witklip, Port Elizabeth, *van der Byl 2492.*

52. **Asterina Woodii** Doidge nov. spec. [Plate LVI.]

Colonies amphigenous, scattered, thin, black, irregularly circular in outline, rather more numerous and better developed on the lower than on the upper surface ; single colonies up to 6 mm. diam., often becoming confluent and covering a large part of the leaf surface.

Mycelium consisting of hyphae which are rather remotely branched and more or less reticulate. Hyphae pellucid, ochraceous tawny, straight or slightly undulating, 3–5 $\mu$ thick, cells 15–35 $\mu$ long ; not infrequently two or more hyphae run closely parallel and become connate. Hyphopodia not very numerous, often rather remote, opposite, alternate or unilateral, usually inclined towards the hypha, less frequently at right angles to it, 2-celled, 10–17·5 $\mu$ long, 3·5–5 $\mu$ broad, cylindrical to subclavate, more or less uncinate or sinuous, rarely sublobed ; basal cell more or less cylindrical, 2·5–10 $\mu$ long.

Thyriothecia numerous, thickly scattered, single, or very often in small, closely crowded groups of 2–8, 120–160 $\mu$ diam., circular in outline or becoming irregular through lateral pressure. Basal membrane pale smoke grey to light greyish olive, composed of radiating hyphae 2·5–3 $\mu$ thick, which are firmly or rather loosely compacted. Covering membrane ochraceous tawny to cinnamon brown, convex, composed of almost straight, radiating hyphae, 2–3 $\mu$ thick ; cells 4–5 $\mu$ long in the centre, somewhat longer towards the margin, which has a fringe of tortuous hyphae 2·5–3 $\mu$ thick ; at first closed, splitting at maturity into a number of triangular segments, by means of radiating, stellate fissures, some of which reach the margin. Asci comparatively numerous, 8–10 in each thyriothecium, ovate to subglobose, 8-spored, sessile, rather thick-walled, 30–37·5 × 22·5–27·5 $\mu$, embedded in a mass of olive ochre mucilaginous matter. Spores conglobate, oblong, rounded at both ends, 1-septate, deeply constricted, cinnamon brown, subopaque, 22·5–25 × 10–12·5 $\mu$ ; almost black and conspicuously echinulate at maturity ; each cell ellipsoid to ovate, the upper slightly larger.

On *Capparis Gueinzii* Sond., Natal, *Medley Wood 6458a*, 9524a, Type.

This is a part of the collection labelled "*Asterina tenuis, Medley Wood 6458*" ; for a discussion of this material see *Asterina radio-fissilis.*

53. **Asterina Rinoreae** Doidge nov. sp.

Sub *Asterina ?vagans* Speg., Trans. Roy. Soc. S. Afr. 8 (1920) p. 261.

Sub *Asterina vagans* Speg. var. *subreticulata* Theiss., in Stevens and Ryan, The Microthyriaceae (1939) p. 69. [Plate LVII.]

Colonies amphigenous, minute or more or less effuse, thin, greyish black, not conspicuous ; more numerous and better developed on the upper side of the leaf.

Mycelium loosely reticulate. Hyphae irregularly branched, tawny olive, ca. 5 $\mu$ thick, almost straight or somewhat undulating, cells 25–30 $\mu$ long. Hyphopodia fairly numerous, alternate or unilateral, 2-celled, straight and erect, or curved or hooked and inclined towards the hypha, 9–17·5 $\mu$ long ; basal cell more or less cylindrical, ca. 5 $\mu$ thick, straight or bent, rarely gibbous, 3–6 $\mu$ long, occasionally up to 12·5 $\mu$ long ; terminal cell asymmetrical, often irregularly 2–3-lobed, lobes rounded or truncate, 8–11·5 $\mu$ broad.

Thyriothecia irregularly scattered, round or somewhat irregular in outline, 100–160 $\mu$ diam. Basal layer delicate, olive buff, formed of rather loosely compacted, radiating hyphae. Covering membrane slightly convex, formed of straight, radiating hyphae 3–3·5 $\mu$ thick, cells 5–7·5 $\mu$ long ; early splitting, by stellate fissures, into numerous, narrow, triangular segments and breaking away in the centre, leaving the developing asci exposed ; margin rather sparsely fimbriate, the fringing hyphae being more or less tortuous near the thyriothecium and then straight, paler 3·5–4 $\mu$ thick and up to 250 $\mu$ long. Asci ovate to subglobose, sessile, 8-spored, 33–37 × 33–35 $\mu$. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, constricted, at first pellucid, tawny olive, darker when mature, 20–24 × 11–12·5 $\mu$, conspicuously verruculose-echinulate at maturity, spinules up to 1 $\mu$ long ; cells subglobose, equal or the upper slightly broader.

Pycnidia similar to the thyriothecia but smaller, 50–60 $\mu$ diam. Conidia brown, with an obscure, lighter medial band, ovate to pyriform, 15–18 × 10–11 $\mu$.

On *Rinorea natalensis* Engl., on leaves, Buccleuch, near Cramond, *Doidge*, 9704, fungus Type 11581.

This fungus has now been compared with a specimen of *Asterina vagans* on *Tournefortia volubilis* (Syd. Fung. exot. exsic. 849) and although it is evidently a closely related species, it is not identical with the American species which occurs on Solanaceae. It is more compact in habit, with stouter hyphae, the spores more coarsely and conspicuously echinulate and the radiating hyphae composing the covering membrane of the thyriothecia more slender. There are also other minor differences.

Abundant material of the host was collected, but colonies of the fungus are not numerous on the leaves. *Asterina Rinoreae* is associated with *Irene Rinoreae*, which occurs on the same leaves.

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**CLYPEOLELLA** v. Höhn.

Fragm. zur Myk. No. 478 (1910).

*cf.* Theissen in Centr. Bakt. II Abt. (1912) p. 229.

Superficial mycelium present, with hyphopodia and 4-celled conidia. Thyriothecia dimidiate, scutate, flat; covering membrane radial in structure, composed of one layer of cells, dehiscing from the centre. Hypothecium flat, filamentous. Hymenium simple, polyascous. Spores 2-celled, usually brown, sometimes almost hyaline.

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KEY TO SOUTH AFRICAN SPECIES.

A.—Thyriothecia 320–400 $\mu$ diam. Spores 23–32 × 11·5–14 $\mu$ ..... 1. *C. Psychotriae.*
B.—Thyriothecia 225–300 $\mu$ diam. Spores 20–25 × 10–12·5 $\mu$ ..... 2. *C. rhamnicola.*

1. **Clypeolella Psychotriae** Doidge nov. comb.

Syn.: *Calothyrium Psychotriae* Doidge (not Ryan) Bothalia I (1922) p. 76. [Plate LVIII.]

Colonies hypophyllous, thin, olive brown, scattered, often developing on the veins, more or less circular in outline, not sharply defined, ca. 8–12 mm. diam., sometimes fairly numerous and becoming confluent.

Mycelium loosely or more closely reticulate, forming a network with angular meshes. Hyphae deep to dark olive buff, almost straight or slightly sinuous, 4–5 $\mu$ thick, obscurely and rather remotely septate, cells 25–40 $\mu$ long, branching irregular. Hyphopodia not numerous, alternate or unilateral, often distant, 1-celled, pyriform pulvinate or sublobed, often trilobulate and broader than long, 7·5–12·5 $\mu$ long and 9–10 $\mu$ broad.

Thyriothecia sometimes scattered, but more frequently rather closely crowded and often becoming confluent in groups, more or less circular in outline, 320–400 $\mu$ diam., often flattened and irregular in shape as a result of mutual lateral pressure. Covering membrane delicate, pellucid, olive buff, slightly convex, formed of radiating hyphae 4–5 $\mu$ thick, cells varying in length from 5–15 $\mu$, margin entire, more or less crenate, not fimbriate. Asci fairly numerous, 8-spored, subglobose to ovate, broadly rounded above, sessile, 40–53 × 35–40 $\mu$. Paraphysoids fibrose, hyaline, more or less persistent. Spores conglobate, oblong, broadly rounded at both ends, 1-septate, not constricted or very slightly so, smooth, rather thick-walled, hyaline, tardily becoming tinted deep olive buff, 23–32 × 11·5–14 $\mu$; cells subequal or the upper slightly shorter and broader.

Conidia borne at the tips of short lateral branches of the hyphae, 3-septate, hyaline to olive buff, more or less cylindrical, straight, slightly curved or abruptly bent near the base, broadly rounded above or subacute, basal cell tapering to a truncate base, 45–55 × 11·5–12·5 $\mu$.

On *Psychotria capensis* Vatke, on leaves, Amanzimtoti, Natal, *Doidge*, 1575 (associated with *Meliola littoralis* Syd., on the same leaves).

The mycelium is hyphopodiate, and not as stated in the original description (Doidge loc. cit.). Apparently mature spores in the ascus are quite hyaline, but spores lying free on the leaf surface become tinted and are almost as dark as the hyphae. It seems not unusual in species of this genus, for spores in the ascus to remain hyaline, probably becoming coloured later, e.g. *Clypeolella Anisophyllae* Syd. (Ann. Myc. 36, 1938, p. 190) and *Cl. Alphitoniae* Syd. (Ibid. 35, 1937, p. 42). In the latter species, the conidia are described as being also hyaline.

2. **Clypeolella rhamnicola** Doidge nov. comb.

Syn.: *Asterina rhamnicola* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 255, 277.

Plate LIX.

Colonies epiphyllous, thin, greyish black, more or less circular in outline, up to 7 mm. diam., scattered, often numerous, becoming confluent and then covering the greater part of the leaf surface.

Mycelium radiating, becoming loosely reticulate with angular meshes. Hyphae mostly straight, dark olive buff to buffy brown, 5–7 μ thick, cells mostly 20–30 μ long; branches numerous, irregular, often opposite. Hyphopodia alternate or unilateral, briefly cylindrical or subglobose, 6–11 μ long and 6–10 μ broad.

Thyriothecia not very numerous, scattered or confluent in small groups of 2–3, formed at the tips of short hyphal branches, more or less circular in outline, 225–300 μ diam. Basal layer hyaline, delicate, structure not evident. Covering membrane slightly convex, delicate, pellucid, deep to dark olive buff, paler than the mycelium, composed of thin-walled, irregularly radiating, rather sinuous hyphae, 3–5 μ thick, septations obscure; margin entire, more or less crenate but not fimbriate: central cells breaking down irregularly at maturity. Asci very numerous, 20–50 in each thyriothecium, often visible through the pellucid covering membrane, 8-spored, broadly ellipsoid to ovate, sessile, 45–55 × 23–37·5 μ. Spores buffy brown, oblong, broadly rounded at both ends, 1-septate, slightly constricted, smooth, 20–25 μ long; cells subequal in length but upper broader, upper cell 10–12·5 μ broad, lower 8–10 μ.

Conidia fairly numerous in some collections (especially in Nos. 14135 and 28343) borne singly at the tips of short hyphal branches, more or less fusoid to sublunate, 40–45 μ long, 12–15 μ broad at the centre or nearer the upper end, tapering to both ends, which are obtuse and 6·5–7·5 μ thick, more or less curved, the curvature being greatest near the ends; on germination, mycelial hyphae develop directly from both ends.

On *Rhamnus prinoides* L'Herit., on leaves, Woodbush. *Doidge*, 1752, Type; Woodbush. *Doidge*, 17737, 28341; Kentani, *Pegler 2315*, 2287, 9068; Pirie Forest, Kingwilliamstown. *Doidge*, 12294; Brander's High Forest, Victoria East, *van der Byl*, 9463a; Deepwalls, Knysna, *Doidge*, 17214; Keurkloof Forest, George, *Doidge*, 17115; Storm's River, *Doidge*, 17179; near Mont-aux-Sources, *Doidge*, 14135; Lundie's Hill, Umkomaas Valley near Bulwer, *Doidge*, 30509; Marwaqa Forest, near Bulwer, *Morgan and Doidge*, 30900; Knysna. *van der Byl 400, 2274, 2281.*

## ASTEROLIBERTIA Arnaud.

Ann. de l'École Nat. d'Agric. de Montpellier, nouv. sér. 16 (1918) p. 165.

Mycelium with node cells or intercalary stigmocysts, without hyphopodia. Thyriothecia similar to those of Asterina, no definite basal membrane. Typical paraphyses wanting. Spores 2-celled, brown.

KEY TO SOUTH AFRICAN SPECIES.

A.—Node cells conspicuous.
- (*a*) Node cells alternating regularly with cylindrical hyphal cells, 7·5–10 μ thick ..... 1. *A. megathyria.*
- (*b*) Node cells distant and irregular, 5–8 μ thick ..... 1a. *A. megathyria*, var. *Randiae.*

B.—Node cells inconspicuous, only slightly broader than the cylindrical hyphal cells 2. *A. Burchelliae.*

1. **Asterolibertia megathyria** Doidge nov. comb.

As *Asterina gibbosa* Gaill. var. *megathyria* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 248. [Plate LX.]

Colonies mostly epiphyllous, but occasionally hypophyllous, scattered, more or less circular in outline, black, crustaceous, up to 3 mm. diam.

Mycelium radiating. Hyphae isabella colour, more or less undulating, 5–6 μ thick, cells 8–15 μ long, or up to 25 μ long in the younger parts of the mycelium, branching irregular, often opposite. Node cells alternating with cylindrical hyphal cells with fair regularity, barrel-shaped to subglobose, often asymmetrical, 7·5–10 μ broad.

Thyriothecia very numerous, densely crowded in the centre of the colony, rarely discrete: separate thyriothecia more or less circular in outline, 140–200 μ diam.; thyriothecia usually crowded, becoming irregular in outline through lateral pressure and fusing in large groups of 6–20 in small colonies, and over 100 in the larger colonies. The mass of thyriothecia often covers the whole centre of the colony and is surrounded by a fringe of radiating hyphae:

less frequently the thyriothecia form an irregular ring round the more or less open centre. Basal layer delicate, subhyaline, structure not evident. Covering membrane convex, Saccardo's umber, becoming darker and subopaque at maturity, formed of straight, radiating hyphae, 2–3 $\mu$ thick, central cells almost cubical, 3–3·5 $\mu$ long, marginal cells up to 5 $\mu$ long; margin not fimbriate; dehiscing at maturity by irregular, stellate fissures. Asci ovate to clavate-cylindrical, 6–8-spored, sessile, with a firm, rather thick wall, which is slightly thickened round the apex, 27–40 × 15–20 $\mu$. Spores conglobate, oblong, rounded at both ends, 1-septate, slightly constricted, deep olive buff, smooth, thin-walled, 16–20 $\mu$ long; upper cell subglobose, 8–9 $\mu$ diam., lower ellipsoid, 9–12 $\mu$ long and 8 $\mu$ broad. Germinating spores give rise to a single hyphopodium, which is irregularly 3–5-lobed, 12–17 $\mu$ long and 10–15 $\mu$ broad; thereafter the spore collapses and two or more hyphae develop from the base of this hyphopodium, growing out to form the mycelium.

On *Tricalysia lanceolata* (Sond.) Burtt Davy, on leaves, Amanzimtoti, *Doidge* 1576; Winter's Kloof, *Doidge*, 1624, 8987; Kentani, *Pegler*, 8787; Claridge, *Doidge*, 8992; Durban, *Medley Wood*, 9027; Town Bush Valley, *Doidge*, 9707; Buccleuch near Cramond, *Doidge*, 9708 Type, and *Sim*, 10151; Umkomaas, *Bottomley*, 11887; Duncairn, near Maritzburg, *Doidge*, 14957.

*Tricalysia sonderiana* Hiern. (= *Kraussia lanceolata* Sond.) Natal, *Medley Wood 6452* (sub *Asterina tenuis* q.v.) 334, 9522; Krantzkloof, *Doidge*, 8985.

Since describing this fungus as a variety of *Asterina gibbosa* Gaill., a more careful comparison has been made with a portion of the type collection of that species (Rabh. Wint. Fung. Eur. 4054, collected in Brasil). This fragment is immature, but it is sufficient to show that, although closely related to the South African fungus, *Asterina gibbosa* differs very considerably in habit and in a number of details. The thyriothecia are widely scattered, and the hyphae appear to be more slender than stated by Theissen; they are ca. 4 $\mu$ thick.

The spores of *Asterina gibbosa* germinate in a similar fashion to that described above in *Asterolibertia megathyria*, but the primary hyphopodium is clavate or ovate, entire, not lobed. In the genus Asterina the spore usually produces one hyphopodium from each cell (usually at each pole) and hyphae develop directly from the spore in close proximity to these. The spore is persistent and can often be detected, unchanged in form, in the centre of large colonies. In the species of Asterolibertia examined, the spore is thin-walled and collapses; it disappears soon after germination.

The genus Asterolibertia was established by Arnaud for Asterina-like fungi with "node cells" or intercalary stigmocysts in place of typical hyphopodia. So far as can be judged from the South African material, these species are sufficiently distinct to warrant their separation into another genus.

1a. **Asterolibertia megathyria** Doidge var. **Randiae** nov. var.

Colonies epiphyllous, rarely hypophyllous, small, up to 2·5 mm. diam. Hyphae 2–4 $\mu$ thick, with node cells which are distant and irregular and 5–8 $\mu$ diam.; cells 7·5–10 $\mu$ long in the neighbourhood of the thyriothecia and the nodes, elsewhere up to 20 $\mu$ long; branches numerous, irregular, often opposite.

Thyriothecia massed in the centre of the colony, as in the type, and similar in colour and structure, 75–100 $\mu$ diam. Asci ovate or subclavate, 4-spored, broadly rounded above, attenuate to a sessile base, 22–28 × 12–15 $\mu$. Spores parallel or conglobate, oblong, 15–18 $\mu$ long, upper cell subglobose, 5–7·5 $\mu$ long and 5–6·5 $\mu$ broad, lower cell subcylindrical, 9–11 $\mu$ long and 5 $\mu$ broad. On germination, spores give rise to a single 1-celled hyphopodium, which is more or less lobed, often palmately 3-lobed, 6–7·5 $\mu$ long and broad.

On *Randia dumetorum* Lam., on leaves, Durban, *Medley Wood*, 9029; Amanzimtoti, *Doidge*, 1682; Umgeni, *Medley Wood*, 9031; Lemana, Northern Transvaal, *Doidge* 1792, Type.

*Canthium Gueinzii* Sond., Hog's Back, Henderson, 11347.

*Canthium capensis* Sond., Hog's Back, *Henderson*, 11348.

2. **Asterolibertia Burchelliae** Doidge nov. comb.

Syn.: *Asterinella Burchelliae* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 267, 278.

*Prillieuxina Burchelliae* (Doidge) Ryan, Stevens and Ryan, The Microthyriaceae (1939) p. 77. [Plate LXI.]

Colonies epiphyllous, minute, black, ca. 1 mm. diam, more or less circular in outline, scattered.

Mycelium rather sparse, radiating. Hyphae dark olive buff to light brownish olive, undulating, 3–4 $\mu$ thick; cells mostly 10–13 $\mu$ long; branching irregular. Node cells alternating with cylindrical hyphal cells with fair regularity, only slightly broader, cylindrical to barrel-shaped, mostly 5–5·5 $\mu$ thick.

Thyriothecia grouped in the centre of the colony, more or less circular in outline, 90–120 $\mu$ diam., often flattened laterally by contact and becoming confluent in groups. Basal layer delicate, subhyaline, structure not evident. Covering membrane slightly convex, snuff brown, composed of straight, radiating hyphae 2·5–3 $\mu$ thick, central cells almost cubical, 3–4 $\mu$ long, cells nearer the margin up to 5 $\mu$ long; margin briefly and rather coarsely fimbriate, fringing hyphae light brownish olive, often subtorulose; breaking up at maturity into several triangular segments, through the formation of stellate fissures. Asci ellipsoid-ovate or broadly cylindrical, rounded above, sessile, with a firm wall slightly thickened round the apex, 27–37·5 × 16–20 $\mu$. Spores conglobate or subdistichous, oblong, rounded at both ends, 1-septate, slightly constricted, dark olive buff, thin-walled, smooth, 13–17·5 × 5–6·5 $\mu$; upper cell somewhat shorter and broader than the lower. On germination the spore gives rise to a single, firm-walled hyphopodium, which is snuff brown, ovate or subglobose, 7·5–9 $\mu$ long and 5–7·5 $\mu$ broad; from the base of this a hypha develops, which early branches to form the mycelium.

On *Burchellia capensis* R. Br. Woodville Forest, George, *Doidge* 10940, Type; Keurkloof Forest, George, *Doidge*, 17121; Storm's River, *Doidge*, 17162; Deepwalls, Knysna, *Doidge*, 17202; Knysna, *van der Byl 2495*, *2285*. *Tarenna pavettoides* Bth. & Hk., Umtentwini, *Wager 184*, 32674.

## **ASTERINELLA** Theiss.

Ann. Myc. 10 (1912) p. 160; Broteria (1912) p. 101.

Syn.: *Prillieuxina* Arnaud, Ann. École Nat. Agr. Montp. 16 (1918) p. 161.

Superficial mycelium brown, septate, branched, without hyphopodia. Thyriothecia dimidiate, scutate, round, radial in structure, dehiscing from the apex. Asci globose to ovate or cylindrical-ellipsoid, with or without typical paraphyses. Spores 2-celled, brown.

KEY TO SOUTH AFRICAN SPECIES.

A.—Spores smooth, 20–26·5 $\mu$ long.
(*a*) Thyriothecia 200–220 $\mu$ diam. ..... 1. *A. Tecleae.*
(*b*) Thyriothecia 120–180 $\mu$ diam. ..... 2. *A. Pterocelastri.*
B.—Spores minutely scaberulous, 28–33 $\mu$ long ..... 3. *A. Mimusopsidis.*

1. **Asterinella Tecleae** Doidge nov. spec. [Plate LXII.]

Colonies hypophyllous, mostly along the leaf margins and veins, thin, greyish black, irregular in outline and poorly defined.

Mycelium delicate, ahyphopodiate, more or less closely reticulate. Hyphae deep to dark olive buff, more or less undulating, irregular in thickness, mostly 2–2·5 $\mu$ thick, occasionally up to 4 $\mu$, sub-nodulose in places, septation obscure, branching freely and irregularly.

Thyriothecia few, interspersed with the pycnidia, from which they are hardly distinguishable, scattered or confluent in groups of 2–4, 200–220 $\mu$ diam. Basal layer delicate, structure not evident. Covering membrane slightly convex, avellanous to buffy brown, pellucid, composed of radiating hyphae 2–3 $\mu$ thick, central cells 4–6 $\mu$ long, cells near margin slightly longer, up to 10 $\mu$; margin briefly fimbriate; splitting at maturity into triangular segments by a number of radiating stellate fissures. Asci fairly numerous, up to ca. 20 in each thyriothecium, 8-spored, subglobose to ovate, sessile, 22–37·5 × 25 $\mu$, with a firm wall ca. 1 $\mu$ thick, slightly thickened (2–5 $\mu$) round the apex. Spores conglobate, at first hyaline, becoming buffy brown rather tardily, subclavate, 1-septate, not constricted or very slightly so, broadly rounded above, tapering to an acutely rounded or subtruncate base, 20–26·5 $\mu$ long; upper cell ovate, 11–14 $\mu$ long and 7·5–10 $\mu$ broad, lower more or less cuneate, 9–12·5 $\mu$ long and 6–8 $\mu$ broad near the septum.

Pycnidia numerous, closely resembling the thyriothecia. Conidia cylindrical or cylindrical-clavate, obtusely rounded to truncate at both ends, hyaline, straight or slightly curved, 7-septate, 45–50 × 3·5–5 $\mu$.

On *Teclea natalensis* Engl., on leaves, West Wood, Haenertsburg, *Doidge*, 17783.

2. **Asterinella Pterocelastri** Doidge.

Bothalia I (1924) p. 198.

Syn.: *Prillieuxina Pterocelastri* (Doidge) Ryan, Stevens and Ryan, The Microthyriaceae (1939) p. 80. [Plate LXIII.]

Colonies hypophyllous, thin, greyish black, circular to irregular in outline, 1–10 mm. diam., scattered or more or less crowded, becoming confluent and covering large areas of the leaf surface.

Mycelium more or less closely reticulate. Hyphae deep to dark olive buff, more or less undulating or tortuous, 2·5–4 μ thick, subtorulose in places, branching freely and irregularly and forming a very irregular network; septation obscure.

Thyriothecia fairly numerous, scattered or in small groups and becoming confluent, circular in outline, 120–180 μ diam. Basal layer delicate, hyaline, structure not evident. Covering membrane slightly convex, dark olive buff, pellucid, formed of rather sinuous, radiating hyphae 2·5–4 μ thick, central cells 3–5 μ long, margin cells longer; margin briefly fimbriate; dehiscing at maturity by irregularly radiating stellate fissures. Asci fairly numerous, mostly 8-spored, occasionally 4-spored, ovate or ovate-oblong, broadly rounded above, sessile, 30–37·5 × 20–25 μ, with a firm wall, ca. 1 μ thick, slightly thickened (ca. 5 μ) round the apex. Spores conglobate or subdistichous, ellipsoid-oblong, rounded at both ends, broadly rounded or tapering slightly above, tapering gradually and more definitely downwards, 1-septate, slightly constricted, smooth, thin-walled, deep to dark olive buff, 20–25 μ long; upper cell usually shorter and broader, 10–11·25 μ long and 8–9 μ broad, lower 12·5–14 μ long and 7–7·5 μ broad at the septum.

On *Pterocelastrus tricuspidatus* Sond. (= *Pt. variabilis* Sond.) on leaves, Storm's River, *Doidge*, 17190; Deepwalls, Knysna, *Doidge* 17222.

The spores are longer than stated in the original description; it is probable that those previously examined were not fully mature.

3. **Asterinella Mimusopsidis** Doidge.

Bothalia I (1922) p. 80.

Syn.: *Prillieuxina Mimusopsidis* (Doidge) Ryan, Stevens and Ryan, The Microthyriaceae (1939) p. 81. [Plate LXIV.]

Colonies hypophyllous, black, more or less circular in outline, up to 5 mm. diam., scattered, occasionally numerous and becoming confluent.

Mycelium radiating. Hyphae slightly undulating, often tortuous, especially in the neighbourhood of the thyriothecia, dark olive buff to isabella colour, irregular in thickness, mostly 2·5–5 μ thick, in places up to 7 μ; cells uneven in length, often 25–35 μ long, but frequently shorter; branching irregular, branches usually at an acute angle with the hypha, becoming much interwoven and tangled; in places 2 or 3 hyphae run closely parallel for some distance, forming loose strands.

Thyriothecia very numerous, rarely scattered, usually closely crowded near the centre of the colony and becoming confluent in groups. Single thyriothecia more or less circular in outline, 350–500 μ diam. Basal layer delicate, hyaline, structure not evident. Covering membrane slightly convex, at first isabella colour to old gold, translucent, rapidly becoming darker in the centre, brownish olive and subopaque; finally it is blackish brown and opaque in the centre, with a broad, translucent margin about 75 μ broad; formed of sinuously radiating hyphae 2·5–4 μ thick, cells mostly 15–20 μ long; margin at first entire, undulating, becoming more or less fimbriate at maturity, fringing hyphae deep olive buff, 3–3·5 μ thick, more or less tortuous; splitting at maturity into a few broad segments, through the formation of stellate radiating cracks, the central part finally breaking wavy. Asci numerous, ovate or ovate-oblong, 8-spored, broadly rounded above, sessile, 60–75 × 25–40 μ, with a firm wall. Paraphysoids sub-persistent, hyaline, filamentous, exceeding the asci, ca. 2–2·5 μ thick, slightly swollen at the tips. Spores distichous or conglobate, oblong, broadly rounded at both ends, 1-septate, constricted, buffy olive, at first smooth, very minutely scaberulous at maturity, 28–33 μ long; upper cell slightly larger, 15–17·5 μ long and 14–16·5 μ broad, lower 14–16·5 μ long and 12–14 μ broad. Spores often found germinating in the ascus.

On *Mimusops obovata* Sond., on leaves, Pirie Forest, Kingwilliamstown, *Doidge*, 12267 East London, *Doidge*, 12409; Alexandria, *Doidge*, 22369.

## LEMBOSIOPSIS Theiss.

Ann. Myc. 11 (1913) p. 435.

Thyriothecia linear, paraphyses present; spores hyaline, 2-celled, mycelium ahyphopodiate.

**Lembosiopsis eucalyptina** Petr. et Syd.

Ann. Myc. 22 (1924) pp. 372–374. [Plates LXV, LXVI.]

Colonies on leaf spots, which are amphigenous, more or less scattered, not penetrating to the opposite side of the leaf, rather sharply defined, more or less circular in outline, 4–8 mm. diam., rarely up to 10 mm., often numerous and becoming confluent, thus forming larger irregular blotches, snuff brown to verona brown.

Mycelium not visible to the naked eye, reticulate; in the centre of the colony with rounded-angular meshes about 25–30 $\mu$ diam. Hyphae dark olive buff to isabella colour, undulating, rather obscurely septate, cells often 25–35 $\mu$ long, often fused by lateral walls into strands of 2 or more, apparently more or less following the outlines of the epidermal cells of the host, and entering the leaf through the stomata. On the older spots, the mycelium becomes denser near the edges, the hyphae running parallel (when closely crowded producing a palisade-like structure) more or less torulose, darker (snuff brown to warm sepia) and with more frequent septations, cells 10–13 $\mu$ long; a more or less definite margin to the colony is thus formed.

Thyriothecia scattered, usually in limited numbers near the centre of the colony, sometimes single, but frequently in groups of 3–4, which fuse at the ends and produce compound Y- or X-shaped ascomata. Individual thyriothecia linear, straight or slightly curved, not tapering towards the broadly rounded ends or only slightly so 250–400 × 75–100 $\mu$. Basal layer quite flat, about 10–12 $\mu$ thick, composed of rather thick-walled cells 4–5·5 $\mu$ diam., the outer cells rather light pellucid olive green, the inner almost hyaline. Covering membrane rather brittle, almost opaque and blackish brown in the centre, composed of rounded-angular or slightly elongated cells ca. 4–5 $\mu$ diam.; near the margin the hyphae are pellucid, definitely radiating and are prolonged more or less freely into the mycelial hyphae. Asci 8-spored, broadly clavate or ovate, broadly rounded above, tapering rather suddenly to a sessile base, thick-walled, thickened round the apex (ca. 5 $\mu$) 28–42 × 12·5–15 $\mu$. Spores distichous or imperfectly tristichous, oblong, broadly rounded at both ends, 1-septate, not constricted or slightly so, 9–12·5 × 4–5 $\mu$; cells approximately equal in length, or the upper slightly shorter and broader than the lower, which tapers somewhat. Paraphyses rather numerous, filiform, stout, 1·5–2 $\mu$ thick, more or less branched at the apex; lateral branches thickened (up to 3 $\mu$) tinged pale olive green, exceeding the asci and forming a typical epithecium.

Pycnidia (*Thyrinula eucalyptina* Petr. et Syd.) scattered, usually near the edge of the leaf spots, discrete, rarely fused in groups of 2 or 3, circular in outline, slightly convex, 80–130 $\mu$ diam., rarely up to 150 $\mu$. Covering membrane brittle, carbonaceous, with a round, central pore ca. 5 $\mu$ diam., similar in structure to the membrane of the thyriothecia. Conidiophores closely crowded, small, conical, ca. 4·5 $\mu$ long, 1·5–2 $\mu$ thick at the base, sometimes up to 10 $\mu$ long, and then cylindrical with a bulbous base. Conidia hyaline, thin, rod-shaped or filiform, more or less curved, seldom quite straight, obtuse at the ends, 1-celled, 5–22 $\mu$ long, 0·75 $\mu$ thick.

On *Eucalyptus coriacea* A. Cunn., on leaves, Jessievale Plantation, Vosmansbeacon, *District Forest Officer*, 17285.

*Eucalyptus gigantea* Dehnh., Jessievale, *District Forest Officer*, 17096, 17266 Type, 20458; Insizwa, E. Griqualand, *District Forest Officer*, 20453; Ingeli, Pietermaritzburg District, *District Forest Officer*, 20455; Kubusi, Stutterheim, *District Forest Officer*, 20456, 20457; Evelyn Valley, Kingwilliamstown, *District Forest Officer*, 20619.

*Eucalyptus globulus* Lab., Woodbush, *Doidge*, 17753.

*Eucalyptus hemiphloia* F. v. M., Jessievale, *District Forest Officer*, 17287.

*Eucalyptus obliqua* L'Her., Jessievale, *District Forest Officer*, 17286.

*Eucalyptus regnens* F. v. M., Jessievale, *District Forest Officer.*, 17265.

*Eucalyptus* sp., Rosetta, Natal, *Sim*, 12494.

The connection between the mycelium producing the pycnidial and the ascus stage seems fairly clear, but Petrak and Sydow (loc. cit.) have described the conidial stage as the type of a new genus, Thyrinula. "In Gesellschaft dieses Pilzes (i.e. *Lembosiopsis*

*eucalyptina*) wächst in dieselben Flecken eine Nebenfrucht-form, die sicher dazu gehört ". Two collections were studied by Petrak and Sydow, No. 17266 on *Eucalyptus gigantea* and No. 17753 on *Eu. globulus*, the former evidently being taken for the type.

Sections of leaves from these two collections have been examined. In leaves of *Eu. gigantea*. the hyphae of the fungus penetrate into the stomatal cavity, and for a short distance between the cells of the mesophyll. (Plate LXVII, a, b.). In the leaves of *Eu. globulus*, there is a more extensive internal mycelium. The hyphae push between the guard cells, proliferate in the substomatal cavity, and often push between the cuticle and the epidermis, forming small patches of subcuticular hypostroma. Separate hyphae grow between the cells of the mesophyll and penetrate as far as the epidermis on the opposite side of the leaf.

The thyriothecia are quite superficial, but the pycnidia may arise from the superficial hyphae or from the subcuticular hypostroma ; in the latter case they are at first covered by the cuticle, which ruptures as they develop ; they are finally superficial.

The parasitism of this fungus and the relation between the ascus and the conidial forms need further study.

## LEMBOSIA Lév.

Ann. Sc. Nat. Sér. 3. Bd. III (1845) p. 58.

Syn. : *Morenoella* Speg. Fung. Guaran. I (1883) p. 258.

Superficial mycelium usually well developed, with hyphopodia. Thyriothecia linear, otherwise like Asterina. Covering membrane developing a longitudinal fissure at maturity. Hypothecium flat, filamentous. Basal membrane thin or wanting. Asci ovate to clavate, thick-walled, with or without typical paraphyses. Spores 2-celled, brown.

### KEY TO SOUTH AFRICAN SPECIES.

A.—Hyphopodia fairly numerous, usually alternate, cylindrical to pyriform..... 1. *L. Phillipsii.*
B.—Hyphopodia few, distant.
(*a*) Hyphae less than 4 $\mu$ thick.
1. Spores 17–20 $\mu$ long..... 2. *L. piriensis.*
2. Spores 15–17 $\mu$ long..... 3. *L. Wageri.*
(*b*) Hyphae 4–6 $\mu$ thick..... 4. *L. durbana.*

**1. Lembosia Phillipsii** Doidge nov. comb.

Syn. : **Morenoella Phillipsii* Doidge, Bothalia I (1924) p. 205. [Plate LXVII.]

Colonies hypophyllous or caulicolous ; on the leaves thin, greyish black, scattered, poorly defined, at first more or less circular and up to 1 cm. diam., often very numerous, becoming confluent and covering large areas of the leaf surface, especially near the margins and base of the leaf ; often densely clothing the stems and petioles of young seedlings.

Mycelium on the leaves loosely reticulate, forming a network with angular meshes ; denser and more closely interwoven on the stems and petioles. Hyphae undulating slightly, buffy brown, 3–4 $\mu$ thick, rather obscurely septate, cells mostly 20–25 $\mu$ long, branching irregular. Hyphopodia fairly numerous, alternate or unilateral, rarely opposite, 1-celled, mostly erect and at right angles to the hypha or nearly so, cylindrical to truncate-conical or subpyriform, rounded or subacute, at the apex, straight or somewhat curved, 6–15 $\mu$ long, mostly 7–9 $\mu$ long, 3·5–5 $\mu$ broad at the base ; in places complete or incomplete circles are formed by the proximity of two hyphopodia on a curved hypha, or by the fusion of a branchlet with a hyphopodium.

Thyriothecia scattered, numerous, discrete, or crowded and becoming confluent in irregular groups ; at first circular, rapidly becoming elliptic or linear in outline, but occasionally remaining almost circular, 240–600 $\mu$ long, 90–160 $\mu$ broad. Covering membrane snuff brown to cinnamon brown, becoming subopaque in the centre, formed of radiating hyphae 3–5 $\mu$ thick, cells mostly 5–6 $\mu$ long ; dehiscing at maturity by a longitudinal slit, which later becomes widely distended, exposing the asci ; margin raggedly fimbriate. Asci fairly numerous, 8-spored, ovate, sessile or with a short, peg-like foot, 26–33·5 × 18–20 $\mu$, with a firm wall, slightly thickened round the apex. Spores tristichous or conglobate, snuff brown, oblong, rounded at both ends, 1-septate, deeply constricted, 14–16·5 $\mu$ long ; cells subequal, or the upper rather shorter and broader than the lower, separating readily at the septum, upper cell 7·5 $\mu$ long and 5·5–6·3 $\mu$ broad, lower 7·5–9 $\mu$ long and 5–5·5 $\mu$ broad.

On *Ocotea bullata* E. Mey., on leaves, Montagu Pass, near George, *Doidge*, 17127 ; Deepwalls, Knysna, *Doidge*, 17205 Type ; Deepwalls, *J. Phillips* (*van der Byl 2257*) ; Knysna, *van der Byl 2279*.

2. **Lembosia piriensis** Doidge.

Bothalia I (1922) p. 78. [Plate LXVIII.]

Colonies epiphyllous, scattered, thin, greyish black, more or less circular, up to 1 cm. diam., sometimes numerous and covering almost the whole of the leaf surface.

Mycelium reticulate, forming a network with angular meshes. Hyphae dark olive buff to isabella colour, slender, straight or somewhat sinuous, 3–3·5 $\mu$ thick, obscurely septate; branching irregular and often more or less fasciculate in the neighbourhood of the hyphopodia. Hyphopodia not numerous, distant, unilateral or alternate, 1-celled, subglobose or pulvinate, rarely sublobed, often broader than long, 4–6 $\mu$ long and 6–9 $\mu$ broad.

Thyriothecia scattered, elliptic in outline, straight, simple or occasionally forked, 200–350 $\mu$ long, 120–170 $\mu$ broad. Covering membrane snuff brown near the margin, early becoming darker in the centre and opaque or subopaque, slightly convex; near the margin, distinctly radiating in structure and formed of hyphae 3-4 $\mu$ thick, cells mostly 8–10 $\mu$ long; copiously and rather briefly fimbriate at the margin; at first closed, then dehiscing by a longitudinal crack. Asci fairly numerous, 6–8-spored, ovate, sessile, 37–42·5 × 20–25 $\mu$, with a firm wall slightly thickened round the apex. Spores conglobate, snuff brown, oblong, rounded at both ends, 1-septate, constricted, smooth, 17–20 × 6–7·5 $\mu$; upper loculus slightly broader. Paraphysoids more or less persistent, fairly numerous, filamentous, subhyaline, about 2 $\mu$ thick.

Pycnidia not very numerous, scattered, hemispherical, 60–100 $\mu$ diam.; covering membrane convex, with a central pore, formed of radiating hyphae 2·5–3 $\mu$ thick. Conidia hyaline, bacillary, up to 5 $\mu$ long and ca. 0·5 $\mu$ broad.

Mycelial conidia scattered, borne laterally on the hyphae, on short, conical, straight or curved, 1-celled conidiophores, or at the tips of short lateral branches, cylindrical or subclavate, snuff brown, 6-12-septate, truncate at the base, rounded or subacute at the apex, very slightly constricted at the septa, occasionally more deeply constricted, especially near the apex, often uneven in width, 50–100 $\mu$ long and 6–9 $\mu$ broad.

On *Trichocladus ellipticus* E. & Z., on leaves, Pirie Forest, Kingwilliamstown, *Doidge*, 12301, Type; Alexandria, *Doidge*, 22426.

This fungus is very similar in general habit to *Asterina secamonicola*, *A. dissiliens* and *A. inconspicua*, the fasciculate branching near the hyphopodia being particularly characteristic. In some respects these four fungi and *Lembosia durbana* resemble the superficial growth of *Asterodothis solaris*, but no internal mycelium could be detected in the leaf sections examined. The mycelial conidia of *Lembosia piriensis* are similar in type to those of *Asterodothis solaris*, but are longer and have more septations; conidia are more numerous in No. 22406 than in the type collection.

*Lembosia piriensis* is found associated with *Isipinga contorta* and *Irene scabra*, on the same leaves.

3. **Lembosia Wageri** Doidge nov. spec. [Plate LXIX.]

Colonies epiphyllous, black, irregular in outline, poorly defined and up to about 3 mm. diam.; at first scattered, but usually very numerous, becoming confluent and covering the whole surface of the leaflet, or at least its lower half.

Mycelium radiating irregularly. Hyphae light greyish olive or greyish olive to buffy brown, 2·5–4 $\mu$ thick, more or less undulating, occasionally running parallel to one another and forming strands of 2 or 3 hyphae, becoming more or less closely interwoven; branching irregular; septations obscure and rather distant. Hyphopodia few, distant, scattered, continuous or 2-celled, very irregular in form, usually more or less lobed, mostly 6–10 $\mu$ long and 5–8 $\mu$ broad, sometimes broader than long.

Thyriothecia very numerous, crowded together in large groups, often becoming confluent or completely fused, forming large, irregular, compound ascomata; single thyriothecia linear-oblong, straight, curved or forked, 200–300 $\mu$ long and 80–120 $\mu$ broad, dehiscing by an irregular longitudinal crack running almost the whole length of the covering membrane, or more or less circular in outline, 120–150 $\mu$ diam., with stellate dehiscence. Basal layer delicate, hyaline, structure not evident. Covering membrane slightly convex, pellucid, buffy brown to warm sepia, becoming subopaque in the centre, formed of radiating hyphae 2–3 $\mu$ thick, cells 4–6 $\mu$ long, marginal cells longer; margin more or less fimbriate, fringing hyphae paler, tortuous, 1·5–2 $\mu$ thick. Asci very numerous, ovate to subglobose, broadly rounded above, sessile, 6–8-spored, 23–30 × 16–20 $\mu$, with a firm wall ca. 1 $\mu$ thick. Paraphysoids not seen. Spores conglobate, becoming almost parallel, clavate-oblong, broadly rounded above, tapering more or less to a rounded base, 1-septate, not constricted

or very slightly so, smooth, greyish olive, 15–17 μ long ; upper cell subglobose, 6·25 μ long and 5·5–6·25 μ broad, lower cuneate-oblong, 8·75–11 μ long and ca. 5 μ broad at the septum.

On *Teclea natalensis* Engl., on leaves, Umhlanga Rocks, Natal, *Wager*, 32472.

It is very difficult to free mature spores from the ascus ; they become parallel and germinate in the ascus, a germ tube being formed consistently at the lower end. From this fact and from an examination of young colonies, it seems likely that the spores are not released from the ascus, but that the germ tubes grow out through it.

4. **Lembosia durbana** van der Byl.

South Afr. Jour. Sci. 26 (1929) p. 319. [Plate LXX.]

Colonies epiphyllous, scattered, thin, greyish black, more or less circular in outline, up to 3 mm. diam.

Mycelium radiating, becoming loosely reticulate. Hyphae buffy brown to olive brown, main hyphae mostly 4–6 μ thick, in places up to 8 μ, often running closely parallel, becoming fused laterally and forming strands of 2–4 elements ; hyphae usually almost straight, in places more or less undulating, rather obscurely septate, cells often 18–25 μ long ; branching irregular, secondary hyphae paler, deep to dark olive buff, 2·5–4 μ thick. Hyphopodia not numerous, unilateral or alternate, often rather darker brown than the hyphae, hemispherical to pulvinate, 3·5–5 μ long, 6–9 μ broad.

Thyriothecia not very numerous, scattered or in small groups near the centre of the colony, oblong to linear, not tapering to the broadly rounded ends, straight, curved or forked and becoming triangular, 300–500 μ long, 140–200 μ broad. Basal layer hyaline or subhyaline, ca. 2·5–4 μ thick. Covering membrane slightly convex, at first buffy brown, becoming blackish brown and opaque in the centre, formed of radiating hyphae 2·5–4 μ thick, more or less fimbriate at the margin ; fringing hyphae pellucid, olive buff to buffy brown, almost straight ; dehiscing at maturity by an irregular longitudinal fissure, running almost the whole length of the covering membrane. Asci fairly numerous, oblong-clavate, broadly rounded above, tapering somewhat to the sessile or subsessile base, 8-spored, 50–60 × 12·5–17·5 μ, with a firm wall, thickened round the apex (5–10 μ). Spores more or less distichous, ellipsoid-oblong, rounded at both ends, 1-septate, rather deeply constricted, buffy brown, smooth, 17–20 μ long ; cells subequal, or the upper somewhat shorter and broader, 7·5–9 μ long and 6–8 μ broad, lower 8–10 μ long and 5·5–7 μ broad. Paraphysoids fibrose, hyaline or subhyaline, subpersistent, 1·5–2·5 μ thick.

Pycnidia fairly numerous, scattered, circular in outline, 50–75 μ diam. ; covering membrane convex, blackish brown, opaque except at the margin, where it is more or less translucent, olive brown, formed of straight radiating hyphae, 2·5–3 μ thick ; dehiscing by a rather indefinite central pore. Conidia not seen.

On *Cassine laurifolia* (Harv.) Davison, Durban, *Forbes* (*van der Byl 2526*).

The host of this fungus is not *Chaetacme aristata* as stated in the original description ; it is certainly a Cassine and probably *Cassine laurifolia*. Unfortunately the type collection consists of only a few detached leaves, and a more certain identification of the host is not possible.

**ECHIDNODES** Theiss. et Syd.

Ann. Myc. 15 (1917) p. 422.

Syn. : *Echidnodella* Th. et Syd., Ann. Myc. 15 (1917) p. 422.

Like Lembosia, but mycellum without hyphopodia.

KEY TO SOUTH AFRICAN SPECIES.

A.—Parasitic on fungus mycelium ..... 1. *Ech. lembosioides*
B.—Leaf parasites.
(*a*) Spores 14–17·5 μ long.
1. Spores 6–6·5 μ broad ..... 2. *Ech. Acokantherae.*
2. Spores 7–9 μ broad ..... 3. *Ech. Rhoina.*
(*b*) Spores 17·5–25 × 6–7·5 μ ..... 4. *Ech. natalensis.*
(*c*) Spores 12–15 × 5–6·5 μ ..... 5. *Ech. africana.*
(*d*) Spores 10–14 × 4–5 μ ..... 6. *Ech. Hypolepidis.*

1. **Echidnodes lembosioides** Doidge nov. comb.

Syn. : *Asterinella lembosioides* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 267, 279.

Plate LXXI.

Mycelium pale, more or less densely reticulate and interwoven, and closely investing the hyphae of *Balladyna velutina* and *Meliola littoralis*. Hyphae deep to dark olive buff, 2–4 μ thick, undulating or tortuous, obscurely septate, branching freely and irregularly.

Thyriothecia fairly numerous, scattered or more or less confluent in small groups, very variable in form, circular in outline, 200–240 μ diam., broadly elliptic, 280–330 × 160–220 μ or linear, 350–800 × 120–180 μ, linear thyriothecia straight, bent or forked; all three forms often occur in the same colony. Basal layer delicate, structure not evident. Covering membrane slightly convex, dark olive buff to buffy brown, becoming blackish brown and opaque in the centre, formed of radiating hyphae 2–4 μ thick; margin not fimbriate or briefly and sparsely so; dehiscing at maturity by irregular central fissures, which in the linear thyriothecia are longitudinal, running almost the whole length of the covering membrane. Asci numerous, oblong-clavate, 8-spored, broadly rounded above, tapering more or less to a sessile base, 35–45 × 17–20 μ, with a firm wall, slightly thickened round the apex. Spores subdistichous or conglobate, oblong, broadly rounded at both ends, 1-septate, slightly constricted, smooth, dark olive buff to buffy brown, 13·5–15 μ long; cells subequal or the upper slightly larger, upper cell 6–7·5 μ long and broad, lower 6·5–7·5 μ long and 5–6·5 μ broad. Paraphyses numerous, persistent, filiform, hyaline, ca. 1 μ thick, somewhat swollen and clavate at the tips.

Pycnidia similar to the round thyriothecia but smaller, 120–180 μ diam. Conidia numerous, hyaline, continuous, fusoid, curved, lunate or sinuous, tapering to both ends, 15–20 μ long, 1·5–2 μ broad in the centre.

On mycelium of *Balladyna velutina* (B. & C.) v. Höhn., and *Meliola littoralis* Syd., on leaves of *Canthium Gueinzii* Engl., Buccleuch, near Cramond, *Doidge*, 11574.

2. **Echidnodes Acokantherae** Doidge nov. comb.

Syn.: *Asterinella Acokantherae* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 266, 278.

*Prillieuxina Acokantherae* (Doidge) Ryan, Stevens and Ryan, The Microthyriaceae, (1939) p. 77. [Plate LXXII.]

Colonies hypophyllous, scattered or crowded, especially numerous near the leaf margins, thin, greyish black, more or less circular in outline and up to 5 mm. diam.; often numerous, becoming confluent, and covering a great part of the leaf surface.

Mycelium delicate, loosely reticulate. Hyphae dark olive buff or ecru olive, more or less undulating, 2·5–4 μ thick, obscurely septate, branching irregular.

Thyriothecia not numerous, scattered, or more frequently in close association with the pycnidia, elliptic to narrow-oblong in outline, straight or curved, occasionally forked, rarely almost circular in outline, 160–250 μ long, 75–100 μ broad. Basal membrane delicate, subhyaline, radiating in structure. Covering membrane slightly convex, dark olive buff to dresden brown, at first pellucid, becoming subopaque in the centre, formed of radiating hyphae 2·5–3 μ thick, closely septate, cells almost cubical, 3–5 μ long, margin fimbriate, dehiscing by a longitudinal slit almost the length of the thyriothecium. Asci numerous, ovate to oblong, broadly rounded above, tapering downwards or narrowed suddenly to a sessile base, 8-spored, 26–35 × 13–17 μ, with a firm wall, slightened (ca. 5 μ) round the apex. Spores subdistichous or conglobate, oblong, rounded at both ends, 1-septate, very slightly constricted, dark olive buff, smooth, thin-walled, 13–17·5 μ long; upper cell 6–7·5 μ long and 6–6·5 μ broad, lower 7–10 μ long, ca. 5 μ broad at the septum and tapering somewhat downwards.

Pycnidia extremely numerous, circular in outline, often becoming confluent and somewhat irregular, 90–120 μ diam.: structure of covering membrane similar to that of the thyriothecia, but somewhat paler, dehiscence stellate. Conidia hyaline, cylindrical to fusiform, 3-septate, base truncate, apex bluntly conical, straight or slightly curved or bent, 20–24 × 3–3·5 μ.

On *Acokanthera spectabilis* Hk. f., on leaves, *Medley Wood 6450*, 333, 9510 and *Medley Wood 6461*, 341, 9521; Tongaat, *van der Byl*, 6951, Type; Bonza Bay, East London, *Bottomley*, 26683; Ebb and Flow, Wilderness, *Doidge*, 17112.

*Acokanthera venenata* G. Don., East London, *Doidge*, 10915, 12393; Alexandria, *Doidge*, 22348; Bracken Hill, Knysna, *van der Byl 2315*.

*Carissa bispinosa* (L.) Desf. (= *Carissa arduina* Lam.) Assegai Bush, Humansdorp Distr., *Doidge*, 17238; Louis Trichardt, *V. A. Putterill*, 11849.

Medley Wood 6450 is quoted by P. Sydow in Fungi natalensis [Hedwigia 38, 1899, p. (132)] and by Medley Wood in the Report of the Natal Bot. Gdns. (1898) p. 11 under the name *Dimerosporium Acokantherae* P. Henn.; this fungus has an intramatrical hypostroma and was transferred by Theissen and Sydow to the genus Hysterostoma (Ann. Myc. 13,

1915, p. 238). It is not to be found on the portion of Medley Wood's collection 6450 in the cryptogamic herbarium at Pretoria, the only fungus on the leaves being the superficial form described as *Echidnodes Acokantherae.*

In *Ech. Acokantherae* thyriothecia are comparatively rare, sometimes absent, but pycnidia are present in great numbers; the latter were evidently confused with the thyriothecia in the earlier description (Doidge loc. cit.); the best ascus material was found in Medley Wood's collection 6461.

3. **Echidnodes rhoina** Doidge.

Trans. Roy. Soc. S. Afr. 8 (1920) pp. 269, 280. [Plate LXXIII.]

Colonies amphigenous, but mostly epiphyllous, scattered, thin, greyish black, becoming more conspicuous and denser black with the formation of numerous thyriothecia, more or less circular, sometimes minute, 1–1·5 mm. diam., or up to 3 mm.; often numerous and, becoming confluent.

Mycelium pale, reticulate. Hyphae more or less undulating, usually only slightly so; main hyphae dark olive buff to buffy brown, 2·5–3·5 $\mu$ thick, rarely up to 5 $\mu$, radiating, and with a tendency to run parallel to one another and fuse in strands of 2 to 3 units, obscurely septate, cells mostly 15–20 $\mu$ long, branching irregular; branches usually paler, deep to dark olive buff, and thinner, 2–2·5 $\mu$ thick, forming an irregular, rather tangled network between the main hyphae.

Thyriothecia not very numerous, scattered, occasionally confluent in small groups, elliptic-oblong in outline, straight, curved or occasionally forked, 150–400 $\mu$ long, 90–150 $\mu$ broad, sometimes almost circular. Covering membrane buffy brown, becoming darker and subopaque in the centre, composed of sinuously radiating hyphae 3–3·5 $\mu$ thick; margin more or less fimbriate; dehiscing by a longitudinal slit, almost the length of the thyriothecium. Asci very numerous, 8-spored, elliptic to ovate, sessile or with a short, peg-like foot, 40–52 × 19–25 $\mu$, with a firm wall, slightly thickened round the apex. Spores distichous or conglobate, dark olive buff, oblong, rounded at both ends, 1-septate, slightly constricted, 14–17·5 $\mu$ long; upper cell almost globose, 7–9 $\mu$ broad, lower slightly narrower, 6–7·5 $\mu$ broad; minutely and rather remotely verruculose-echinulate at maturity.

On *Rhus lucida* E. Mey., on leaves, van Staden's Pass, *Doidge*, 10887, Type, and *Doidge* 17263; Howieson's Poort, near Grahamstown, *Doidge*, 10957; Assegai Bush, Humansdorp District, *Doidge*, 17244; Hamilton Reservoir, Grahamstown, *Britten*, 14212.

*Rhus mucronata* Thunb., Knoetze, Knysna, *van der Byl 2300.*

*Rhus Schlechteri* Deels, Humewood, Port Elizabeth, *Doidge*, 2295.

On re-examination, the thyriothecia appear to be shorter than stated in the original description, and the asci and spores somewhat larger.

4. **Echidnodes natalensis** Doidge nov. comb.

Syn.: *Lembosia natalensis* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 268, 279, Pl. XIX, fig. 44. [Plate LXXIV.]

Colonies hypophyllous, thin, greyish black, scattered, poorly defined but more or less circular in outline, up to ca. 5 mm. diam.; often becoming confluent and covering the greater part of the leaf surface.

Mycelium loosely reticulate, forming a network with angular meshes. Hyphae dark olive buff, straight or somewhat sinuous, 3–3·5 $\mu$ thick, rather obscurely septate, branching irregular. No true hyphopodia; the cylindrical bodies described as hyphopodia (Doidge loc. cit.) appear to be undeveloped branches.

Thyriothecia scattered, elliptic to linear, occasionally forked, usually discrete, rarely becoming confluent, 280–450 $\mu$ long, 140–170 $\mu$ broad. Covering membrane buffy brown to snuff brown, more or less translucent, formed of radiating hyphae 2·5–3·5 $\mu$ thick, with cells 8–10 $\mu$ long; not fimbriate at the margin, or very briefly and sparsely so; dehiscing at maturity by an irregular longitudinal crack. Asci fairly numerous, 6–8-spored, subglobose or ovate, broadly rounded above, sessile 30–38 × 20–27 $\mu$, with a firm wall, slightly thickened round the apex. Spores conglobate, oblong, rounded at both ends, 1-septate, slightly constricted, buffy brown, smooth, 17·5–25 × 6–7·5 $\mu$; upper cell slightly broader and sometimes shorter than the lower. Paraphysoids fairly persistent, hyaline, fibrose.

Pycnidia rather numerous, circular in outline, 200–250 μ diam.; covering membrane pellucid, dark olive buff, composed of radiating hyphae ca. 2 μ thick, dehiscence stellate. Conidia hyaline, fusoid with truncate base, 18–20 × 3·5–5 μ.

On *Eugenia zuluensis* Dümmer, on leaves, Krantzkloof, Natal, *Doidge*, 8984; associated with *Asterina natalitia*.

The photograph reproduced in a previous paper (Doidge loc. cit.) gives a good idea of the habit of this fungus, but the picture is somewhat obscured by the presence of a parasite with dark conidia.

5. **Echidnodes africana** Doidge nov. comb.

Syn.: *Morenoina africana* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 242, 281.

[Plate LXXV.]

Colonies amphigenous and on the rachis, minute, barely visible to the naked eye, scattered, occasionally crowded and becoming more or less confluent.

Mycelium sparse, radiating irregularly. Hyphae 2–2·5 μ thick, deep to dark olive buff, more or less undulating, obscurely septate, branching irregular.

Thyriothecia scattered or confluent in small groups, elliptic to linear, straight, curved or bent, occasionally forked, 120–200 μ long, 65–100 μ broad; sometimes becoming fused at the ends and forming L, Y.T. or K-shaped, compound ascomata, less frequently parallel and fused laterally. Covering membrane pellucid, dark olive buff to buffy brown, becoming darker and subopaque near the centre, slightly convex, formed of radiating hyphae 2–3 μ thick, cells almost cubical, 2–3·5 μ long; margin irregular but not fimbriate, a few of the hyphae forming the covering membrane run out into the mycelium; dehiscing by a longitudinal slit, almost the length of the thyriothecium. Asci very numerous (immature) oblong or ellipsoid-clavate, 23–27 × 10–12 μ. Mature spores only seen outside the ascus, o long, rounded at both ends, 1-septate, scarcely constricted, buffy brown, smooth, 12–15 × 5–6·5 μ; cells equal or the upper slightly broader.

Pycnidia in small groups of 2–5, often in close contact with the thyriothecia, circular in outline, 60–100 μ diam., or becoming confluent, more or less flattened laterally and irregular in shape. Covering membrane dark olive buff, radiating, similar in structure to that of the thyriothecia, margin not fimbriate, dehiscence stellate. Conidia hyaline, ellipsoid, 3–5 × 1·5–2 μ.

On *Dryopteris inaequalis* (Schl.) O. Kze., on pinnules and rachis, Zwartkop, near Maritzburg, Natal, *Doidge*, 11605.

A more careful study of this fungus reveals the presence of a delicate mycelium, which is persistent and radiating from the thyriothecia; it is therefore more suitably placed in the genus Echidnodes.

6. **Echidnodes Hypolepidis** Doidge nov. comb.

Syn.: *Echidnodella Hypolepidis* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) pp. 270, 281.

[Plate LXXVI.]

Colonies mostly epiphyllous, small, irregular in outline, scattered or confluent, usually along the midrib of the pinnules.

Mycelium ahyphopodiate, poorly developed, radiating irregularly or loosely reticulate. Hyphae slender, deep to dark olive buff, more or less deeply undulating, 2–3 μ thick; branching irregular, septation obscure.

Thyriothecia oblong, straight or curved, often forked, 120–240 × 50–100 μ, rarely single, usually confluent in irregular groups in the centre of the colony, often completely fused and forming large, irregular, compound ascomata. Basal membrane delicate, structure not evident. Covering membrane slightly convex, buffy brown, pellucid, composed of radiating hyphae 2·5–3·5 μ thick, central cells almost cubical, marginal cells longer, up to 15 μ long; margin irregular but not fimbriate; dehiscing by a longitudinal slit nearly the length of the thyriothecium. Asci (immature) 8-spored, ovate, broadly rounded above, sessile, 20–25 × 7–10 μ. Spores conglobate, buffy brown, oblong, rounded at both ends, 1-septate, slightly constricted, 10–14 × 4–5 μ; upper cell slightly broader and more broadly rounded.

Pycnidia round, 75–100 μ diam., with covering membrane similar in structure to that of the thyriothecia. Conidia ovate, ellipsoid or oblong, olive buff, 10–13 × 5 μ.

On pinnules of *Hypolepis sparsisora* (Schrad.) Kuhn. Woodville Forest, George, *Doidge*, 10930.

## SPECIES EXCLUDENDAE.

**Amazonia asterinoides** (Wint.) Theiss.

Ann. Myc. 11 (1913) p. 499; Doidge and Sydow, Bothalia 2 (1928) p. 427.

Syn.: *Meliolaster Mackenzii* Doidge, Trans. Roy. Soc. S. Afr. 8 (1920) p. 123.

On *Piper capensis* L.f., on leaves, Buccleuch, near Cramond, *Doidge*, 11570.

The original description (Theissen loc. cit.) places the genus Amazonia in the Microthyriaceae, because the perithecium is inverse and radial in structure. v. Höhnel (18) has shown that in this genus, under the shield-like cover, a completely closed perithecium exists, and regards this as a transition genus between Meliola and the Microthyriaceae.

In the Synoptische Tafeln of Theissen and Sydow (43), Amazonia is included in the Microthyriaceae, but Petrak (25, p. 123) points out that it is not nearly related to the genera which are placed on either side of it in the key. Theissen and Sydow themselves state (loc. cit.) that the genus is obviously similar to Meliola in the form of hyphae, hyphopodia and spores. Petrak points out that the resemblance is not confined to such external and purely unessential characters, but the history of development is similar and the resemblance is phylogenetic: the two genera cannot be placed in different families in a system of classification.

*Amazonia asterinoides* was included by Doidge and Sydow (14) in the Meliolineae.

**Asterella Rehmii** P. Henn.

Engl. Bot. Jahrb. 17 (1893) p. 114; Hopkins, Trans. Rhod. Sc. Ass. 35 (1938) p. 103.

On *Aloe* spp.

This is *Placoasterella Rehmii* (P. Henn.) Th. et Syd. in Ann. Myc. 13 (1915) p. 237; Doidge in Bothalia I (192 L) p. 12.

As *Parasterella* nov. gen. in Herb. van der Byl No. 1667.

**Asterina capensis** Kalch. et Cke.

Grevillea IX (1880) p. 32.

On leaves of *Hippobromus alata* E. & Z., Grahamstown, *MacOwan 1328*.

This is *Meliola capensis* (K. et Cke.) Theiss., Ann. Myc. 10 (1912) p. 19. See also Doidge in Trans. Roy. Soc. S. Afr. 8 (1917) p. 731 and Bothalia I (1924) p. 71; also Doidge and Sydow in Bothalia 2 (1928) p. 442.

**Asterina confluens** Kalch. et Cke.

Grevillea IX (1880) p. 33, Pl. 137, fig. 45.

On *Plectronia ciliata*, *MacOwan 1331*.

According to van Höhnel (17), this is the conidial stage of an indeterminable fungus. The fragment of the type in the Pretoria Herbarium is quite sterile and so also is a more recent collection. The host is now known as *Canthium ciliatum*.

**Asterina ditricha** Kalch. et Cke.

Grevillea IX (1880) p. 32.

On leaves of *Celastrus* sp., Inanda, Natal, May 1876, *Medley Wood 3*.

This is *Irene ditricha* (K. & Cke.) Doidge in S. Afr. Jour. Nat. Hist. 2 (1920) p. 41. Doidge and Sydow in Bothalia 2 (1928) p. 433.

As *Meliola ditricha* (K. & Cke.) Doidge in Trans. Roy. Soc. S. Afr. 5 (1917) p. 728 and 8 (1920) p. 138.

As *Irenina ditricha* (Doidge) Stevens in Ann. Myc. 25 (1927) p. 467.

**Asterina infuscans** Wint.

Hedwigia 24 (1885) p. 24; Theissen, Die Gattung Asterina (1913) p. 28.

As *Asterella infuscans* (Wint.) Sacc. in Syll. Fung. IX (1891) p. 394.

Theissen (loc. cit.) states that the ascomata of this fungus are not formed inversely beneath a hypha as in the Microthyriaceae but through a coil-like thickening of the ahyphopodiate hyphae; the wall of the ascoma is parenchymatous, formed of almost spherical cells.

Winter's description is as follows: "Mycelium e hyphis ramosissimis, torulosis flexuosisque, septatis, fuscis, densissime intertextis constans, foliorum paginam inferiorem longe lateque obducens et infuscans. Perithecia gregaria sparsaque, minutissima, depresse

hemisphaerica, centro diffracta et demum evanescentia, fusco-atra, ambitu fibrillosa, 95–130 $\mu$ lata. Asci oblongi seu e basi parum ventricosa, sursum elliptici, fere sessiles vel in stipitem brevem attenuati, 8-spori, 30–35 $\mu$ longi, 9–11 $\mu$ crassi. Sporae conglobatae, clavatae, 2-cellulares, medio non constrictae, hyalinae, 8–9·5 $\mu$ longae, 2·5–3 $\mu$ crassae.

Ad folia subviva *Eucleae undulatae* Thunb. ad latera montis Boschberg prope Somerset East, Prom. bonae spei, leg MacOwan."

This fungus is missing from MacOwan's collections in the National Herbarium, Pretoria ; the original material is apparently immature, and Theissen was unable to find asci or spores. Its systematic position must remain doubtful until a study can be made of further collections in a more mature condition.

**Asterina interrupta** Wint.

Flora (1884) p. 264.

On *Leucadendron* sp., on leaves, Muizenberg, *MacOwan* (Rabh. Fung. Eur. 3952).

*Leucospermum conocarpum*, Hottentots Holland, *MacOwan* (Rahb. Fung. Eur. 3951).

This is *Entopeltis interrupta* (Wint.) v. Höhn., Fragm. z. Myk. 10 (1910) No. 489. Figured by Doidge in Bothalia 2 (1927) p. 233.

**Asterina MacOwaniana** Kalch. et Cke.

Grevillea VII (1878) p. 57 and IX (1880) p. 33.

On *Gymnosporia buxifolia*, Boschberg, *MacOwan 1250* (de Thüm. Myc. Univ. 568).

This is *Parenglerula MacOwaniana* (Thüm.) v. Höhn., Fragm. z. Myk. 10 (1910) No. 525. See also Doidge in Bothalia 1 (1924) p. 212 and Petrak in Ann. Myc. 26 (1928) p. 404. This fungus was figured by Arnaud (3, Plate 38) under the name *Englerulaster MacOwanianus* (Thüm.) Arn.

**Asterina myriadea** Cke.

Grevillea X (1882) p. 130.

On leaves, Inanda, Medley Wood.

This is *Dimerium myriadeum* (Cke.) Theiss. in Ann. Myc. 10 (1912) p. 193 ; as *Dimerosporium*, Cooke in Grevillea XL (1882) p. 37.

**Asterina phaeostroma** Cke.

Grevillea X (1882) p. 130.

On *Pavetta natalensis* on leaves, Inanda, *Medley Wood 656*, Herb. Kew. *Kraussia lanceolata*, Inanda, *Medley Wood 652*.

This is *Balladyna velutina* (B. & C.) v. Höhn., Fragm. z. Myk. 10 (1910) No. 482. See also Theissen in Ann. Myc. 10 (1910) p. 16 and Doidge in Trans. Roy. Soc. S. Afr. 5 (1917) p. 715.

**Asterina solaris** Kalch. et Cke.

Grevillea IX (1880) p. 33.

On leaves, Cape, *MacOwan 1307*, Rabh. Fung. Eur. 3651.

This is *Asterodothis solaris* (K. & Cke.) Theissen in Ann. Myc. 10 (1912) p. 179 ; see also Theissen and Sydow in Ann. Myc. 13 (1915) p. 252 and Doidge in Bothalia I (1921) p. 10.

**Asterina sphaerasca** Thüm.

Fung. austro-afric. 119, in Flora (1878) p. 356.

On living leaves of *Capparis Gueinzii* Sond., Olifants Hoek, Uitenhage District, leg. *B. Holland* (MacOwan 1273).

The following is the original description of this fungus ; " Mycelio vel stromate tenui, plus minusve orbiculato, stellato-dendritico, nigro ; hyphis inaequalibus griseo-fuscis, repentibus, longis, ramosis ; peritheciis minutis, numerosis, granuloso-punctiformibus ; ascis exacte sphaericis, episporio crassissimo laevi, quadrisporis, hyalinis vel flavescentibus, 35 $\mu$ diam. ; sporis ellipticis, utrinque rotundatis, bicellularibus, medio constrictis, dilute flavidis demum fuscidulis, pellucidis, 20 $\mu$ longis, 12 $\mu$ crassis ".

It has not been possible to trace the type specimen of this species ; *MacOwan 1273* is missing from the MacOwan collections in the Pretoria Herbarium and from those in the South African Museum, Capetown, nor is it to be found at Kew. In a previous publication

9) this name was given to No. 9010 on *Capparis citrifolia*, now described as *Asterina elegans*. The description might equally well apply to *A. Woodii*, *A. capparidicola* or *A. Capparidis* Syd., all of which occur on Capparis spp.

Theissen includes this fungus in his "Species non visae vel dubiae" and it must be regarded as a doubtful species until the type is found.

**Asterina ? stylospora** Cke.

Grevillea X (1882) p. 129.

On *Sponia guineensis*, on leaves, Inanda, Medley Wood 564.

Theissen (37, p. 13 and 41, p. 36) says "Die Art is zu streichen" but on p. 100 of the latter publication quotes it as a possible synonym for *Asterina Sponiae* Rac., and the species is thus placed by Stevens and Ryan (32, p. 71).

Abundant material of this fungus is now available; it is a form with conidia similar to those of Asterostomella, but the pycnidia are subglobose and not radial in structure. *Oothecium consimile* Syd. on the same host from Sierra Leone is evidently the same fungus. It differs widely from *Asterina Sponiae* in mycelial characters and hyphopodia, and may be described as follows.

**Oothecium stylosporum** (Cke.) Doidge, nov. comb.

Syn.: *Asterina stylospora* Cke., Grev. X (1882) p. 129.

*Oothecium consimile* Syd., Ann. Myc. 28 (1930) p. 443.

Colonies always hypophyllous, black, more or less circular, ca. 1-3 mm. diam., scattered over the whole leaf surface, often numerous and crowded, becoming confluent and thus covering larger, irregular areas of the leaf. Mycelium pale, consisting of hyphae at first radiating, but soon becoming tangled and interwoven, sometimes forming loose strands. Hyphae thin-walled, greyish olive to cirrine drab, uneven in thickness, mostly 4-6 $\mu$ thick (3·4-5 $\mu$ *fide* Sydow) more or less undulating, obscurely septate, branching freely and irregularly. Hyphopodia not very numerous, alternate, septate, 11-32 $\mu$ long; basal cell straight or curved, usually more or less cylindrical, 3-25 $\mu$ long, 3-4 $\mu$ broad; terminal cell usually broadly clavate, with rounded or flattened apex, 9-13 $\mu$ long, 6-9 $\mu$ broad (those with a long stipe are regarded by Sydow as short, lateral, hyphal branches closely resembling true hyphopodia).

Pycnidia produced in great numbers, often in closely crowded groups, globose or globose-ovate, very variable in size, 60-100 $\mu$ diam.; at first quite closed; wall membranous, consisting of irregularly polyhedral pellucid, olive brown cells, 5-9 $\mu$ diam., which, at maturity break down, through mucilaginous histolysis, beginning at the apex. Conidia produced very freely, deep olive brown to olive brown with a distinct hyaline medial band 2-3 $\mu$ broad, very variable in form, mostly ovate to oblong, less frequently pyriform, ellipsoid or subglobose, usually broadly rounded above but with a short, pale mucro up to 3 $\mu$ long, usually tapering more or less to the base. The conidia are borne on the inner surface of the wall of the pycnidium on truncate-conical conidiophores.

On *Trema guineensis* (Schum.) Ficalho (= *Sponia Guineensis* Planch.) Inanda, *Medley Wood 564* (Type, collection) 793, 9499, 10191; Verulam, *Pole Evans*, 6801; Krantzkloof, *Doidge*, 9101.

**Asterina tenuis** Wint.

Hedwigia 25 (1886) p. 94; Sacc. Syll. Fung. IX, p. 389; see also Theissen, Die Gattung Asterina (1913) p. 116 and Doidge, Trans. Roy. Soc. S. Afric. 8 (1920) p. 250.

*Asterina tenuis* was originally described "on living leaves of a tree" from the island of S. Thomé.

Theissen (loc. cit.) states that in various herbaria are to be found specimens under this name, from Natal, on leaves of *Kraussia coriacea*, and on leaves of other plants (Medley Wood 6452, 6458), which differ from the original. This name was applied to Medley Wood's collection 6458b in a previous publication (Doidge loc. cit.).

A discussion of fungi found under this name in Medley Wood's collections has been given after the descriptions of *Asterina radiofissilis*, *A. Woodii* and *Asterolibertia megathyria*.

**Asterina toruligena** Cke.

Grevillea X (1882) p. 129.

On living leaves, Inanda, *Medley Wood 559*.

The type specimen of this fungus in the Kew Herbarium was examined by Theissen, who found no recognisable Microthyriaceous ascomata; nor are mature ascomata to be

found on the portions of the type collections in the Pretoria Herbarium. The few round, opaque bodies present, if they are ascomata, contain no asci. The asci and spores described by Cooke can therefore not be found on the type collection. Unfortunately the collection consists of a few detached leaves and the host is undeterminable. The mycelium consists of brown hyphae radiating from the centre of the colony; they are not hyphopodiate and give rise freely to oval, 1-celled, brown conidia. The material is scanty and fresh collections will be necessary if a complete study of the fungus is to be made. It is definitely not an Asterina.

**Englerulaster Gymnosporiae** (P. Henn.) Theiss.
Beihefte Bot. Centralb. (1912) p. 51.
On leaves of *Gymnosporia buxifolia*, Natal.

This fungus was originally described by Hennings under the name *Dimerosporium Gymnosporiae* (Sacc. Syll. Fung. XVI p. 406). A collection made in Mozambique by Howard (Myc. Herb. Pretoria No. 523) was identified by Sydow (Ann. Myc. 7, 1909, p. 546) as *Dimerium Gymnosporiae* (P. Henn.) Syd., but unfortunately the remaining portion of this material is fragmentary and the leaves bear only one colony of *Asterina dissiliens*; there is therefore no authentically named material of *Englerulaster Gymnosporiae* in the Pretoria Herbarium for comparison with recent collections.

Petrak (Ann. Myc. 32, 1934, p. 432) has redescribed this fungus as *Parenglerula Henningsii* Petrak, but from his description it might well be a form of *Parenglerula MacOwaniana* (Thüm.) v. Höhn., which is a very common and somewhat variable species. As Arnaud (3, p. 183) points out, both fungi were collected on *Gymnosporia buxifolia* in Natal and the Eastern Cape. *P. MacOwaniana* has been found on species of *Gymnosporia*, *Putterlickia* and *Cassine*, the form on *Cassine* having been described by Werdermann (46) as a distinct variety, var. *Elaeodendri* on *Elaeodendron Kraussianum* (=*Cassine Kraussiana*).

**Englerulaster MacOwaniana** (Thüm.) Arn.
Ann. École Nat. Agr. Montp. 16 (1918) p. 183.
This is *Parenglerula MacOwaniana* (Thüm.) v. Höhn.; see *Asterina MacOwaniana*.

**Eupelte amicta** Syd.
Ann. Myc. 22 (1924) pp. 426, 427, cum icones.
On leaves of *Olea laurifolia*, Haenertsburg, Transvaal, *van der Byl 1510*.

Sydow states that this fungus is quite superficial, and although the structure of the ascomata is not radiating in the strict sense, assigns it to the Microthyriaceae. He had, however, to make his studies from very sparse material.

In a number of sections made from the type collection, and from other collections in the Pretoria Herbarium, it was found that the superficial mycelium is connected at many points through the cuticle and also through the stomata, with a colourless hypostroma, which almost fills the epidermal cells of the leaf of the host.

It seems, therefore, that in the system of classification adopted by Theissen and Sydow (43), this fungus is more suitably placed in the Polystomellaceae.

**Lembosia congesta** Wint.
Exot, Pilze in Flora (1884) p. 9.
On *Carissa arduina* on leaves, Cape, *MacOwan 1292*.
This is *MacOwaniella congesta* (Wint.) Doidge, in Bothalia I (1921) p. 9.

**Lembosia radiata** Doidge.
Trans. Roy. Soc. S. Afr. 8 (1920) p. 269.
On shrub undet. (Leguminosae) Rikatli, *Junod*, 11729.
This is *Schneepia radiata* Doidge, in Bothalia I (1921) p. 5.

**Morenoella Oxyanthae** Doidge.
Trans. Roy. Soc. S. Afr. 8 (1920) pp. 270, 281.
This is *Hysterostomina Oxyanthae* Doidge, Bothalia 2 (1927) p. 232.

**Phragmothyrium Marattiae** (P. Henn.) v. Höhn.
Sitzber. K. Akad. Wiss. Wien 121 (1912) p. 347.
On *Marattia fraxinea*.

This fungus was described by von Thümen as *Leptosphaeria caffra* (Fung. austro-afric. 32 in Flora, 1876, p. 363); it was called *Sphaeria caffra* Kalch. et Cke. in Grevillea IX (1880) p. 30 and *Micropeltis Marattiae* P. Henn. in Hedwigia 34 (1895); and in Ann. Myc. 14

(1916) p. 450, Theissen and Sydow established the genus *Phragmosperma*, and renamed this fungus *Phragmosperma Marattiae.*

In the Ann. Myc. 25 (1927) pp. 261-262, Petrak, as a result of a critical study of more recent collections, recorded the presence of a parenchymatic stromatal tissue between the perithecia, and retransferred the fungus to the Sphaeriaceae under the name *Metasphaeria caffra* (Thüm.) Petr.

**Phragmothyrium Trichomanis** (P. Henn.) v. Höhn.

Sitz. K. Akad. Wiss. Wien, 121 (1912) p. 347.

On leaves of *Trichomanes pyxidifera*, Natal, *Medley Wood.*

The type specimen has not been seen, but a fungus has been found on another collection of this host which agrees with the original description ; in this fungus, the structure of the covering membrane of the thyriothecium is not radial, and it obviously belongs to the Hemosphaeriaceae. It seems preferable, therefore, to retain the original name, *Micropeltis Trichomanis* P. Henn. [Engl. Bot. Jahrb. XXVIII (1900) p. 326] for this fungus.

**Seynesia orbiculata** Syd.

Ann. Myc. 10 (1912) p. 39.

On *Euclea natalensis.*

This fungus does not belong to the Microthyriaceae ; it has a distinct, epidermal hypostroma and is identical with the fungus described as *Palawaniella Eucleae* Doidge. It must therefore be known as **Palawaniella orbiculata** (Syd.). Doidge nov. comb. Syn. : *Palawaniella Eucleae* Doidge in Bothalia I (1921) p. 17, fig. 3.

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## ASTEROSTOMELLA FORMS.

A number of species of Asterina very rarely produce thyriothecia, but it is often possible to recognise them by the mycelium and conidia. The following key is an attempt to distinguish species of Asterina without reference to the thyriothecia ; two species of Asterostomella are included, of which the ascus stage is not known. No Asterostomella conidia have been seen in association with South African species of Asterina belonging to the sections Parasterina and Englerulaster.

In the key, A=Asterina, and the numbers refer to descriptions in earlier pages ; Ast.=Asterostomella.

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### KEY TO ASTEROSTOMELLA—FORMS.

A.—Conidia brown ; colour continuous, without hyaline or lighter band ; no conspicuous germ pores.

(*a*) Germination from the basal end.

1. Hyphopodia 2-celled, lobed ..... 47. *A. peraffinis.*
2. Hyphopodia continuous, pyriform ..... 21. *A. crotoniensis*

(*b*) Germination lateral.

1. Hyphopodia mostly septate.
   - x. Hyphopodia few, 1–5-celled, apical cell usually clavate or cylindrical ..... 30. *A. Woodiana.*
   - xx. Hyphopodia fairly numerous, mostly 2-celled, slender, cylindrical 50. *A. elegans.*
2. Hyphopodia continuous, more or less lobed.
   - x. Hyphopodia with shallow lobes.
     - o. Pycnidia with basal membrane, conidia 17·5–25 × 15–20 μ 44. *A. Excoecariae.*
     - oo. Pycnidia without basal membrane—
       - (i) Conidia 19–24 × 13–17·5 μ ..... 19. *A. delicata.*
       - (ii) Conidia 14–24 × 10–13 μ ..... 25. *A. Pavoniae.*
   - xx. Hyphopodia deeply lobed.
     - o. Conidia broadly ovate to globose, 13·5–19 × 12–14 μ .... 43. *A. diplocarpa.*
     - oo. Conidia ovate to pyriform, 11–18 × 10–13 μ ..... 42. *A. tertia*, var. *africana.*

B.—Conidia with conspicuous germ pores, but no lighter medial band.

(*a*) Hyphopodia 2-celled, cylindrical. Conidia rhomboid, with 4 papillate germ pores at the angles ..... 33. *A. Scolopiae.*

(*b*) Hyphopodia continuous. Conidia ovate with equatorial germ pores.

1. Germ pores, 4 in one band. Hyphopodia lobed ..... 40. *A. clausenicola.*
2. Germ pores, 4 or 8 in one or two bands. Hyphopodia finger- or flask-shaped, rarely lobed ..... 20. *A. Grewiae.*

C.—Conidia with a more or less distinct, hyaline or pale medial band.

(*a*) Pycnidia with basal membrane.

1. Hyphopodia continuous.

x. Hyphopodia lobed.

o. Conidia 7·5–11 $\mu$ broad ... 39. *A. polythyria.*

oo. Conidia 10–15 $\mu$ broad ... 41. *A. erysiphoides.*

ooo. Conidia 15–20 $\mu$ broad ... 44. *A. Excoecariae.*

xx. Hyphopodia cylindrical, not lobed ... 38. *A. loranthicola.*

2. Hyphopodia 2-celled.

x. Hyphopodia deeply lobed ... 53. *A. Rinoreae.*

xx. Hyphopodia with shallow lobes or subentire, mostly alternate.

o. Hyphopodia 3–4 $\mu$ broad ... 45. *A. Fleuryae.*

oo. Hyphopodia 5–10 $\mu$ broad.

(i) Medial band in conidia distinct.

y. conidia 11–15 × 7–9 $\mu$ ... 48. *A. radio-fissilis.*

yy. Conidia 14–20 × 8–12·5 $\mu$ ... 49. *A. africana.*

(ii) Medial band indistinct. Conidia 17·5–20 × 9–10 $\mu$ ... 46. *A. van der Bylii.*

ooo. Hyphopodia not lobed, mostly opposite. Conidia 15–21 × 10–12·5 $\mu$ ... 51. *A. capparidicola.*

(*b*) Pycnidia without basal membrane.

1. Hyphopodia continuous, 1-celled.

x. Hyphopodia lobed.

o. Conidia 10–14 × 4–6 $\mu$ ... 26. *A. xumenensis.*

oo. Conidia 16–20 × 7·5–10 $\mu$ ... 20*a*. *A. Grewiae*, var. *zonata.*

xx. Hyphopodia not lobed.

o. Conidia 15–22 $\mu$ long.

(i) Conidia 7·5–9 $\mu$ broad ... 20*a*. *A. Grewiae*, var. *zonata.*

(ii) Conidia 10–12·5 $\mu$ broad ... *Ast. Visci.*

oo. Conidia 20–30 × 10–15 $\mu$ ... 16. *A. Hendersoni.*

2. Hyphopodia mostly 2-celled.

x. Conidia mostly 15–20 $\mu$ long.

o. Hyphopodia 4–5 $\mu$ broad, basal cell 3·7–5 $\mu$ long; pycnidia 100–150 $\mu$ diam ... 32. *A. reticulata.*

oo. Hyphopodia 5–6 $\mu$ broad, basal cell 4–10 $\mu$ long; pycnidia 75–120 $\mu$ diam ... *Ast. eugenicola.*

xx. Conidia 18–26 × 9–13 $\mu$; Pycnidia 60–90 $\mu$ diam ... 36. *A. Combreti.*

**Asterostomella eugenicola** Doidge nov. spec.

Colonies amphigenous, black, more or less round to irregular in outline; sometimes scattered, discrete, up to 4 mm. diam.; more frequently numerous, crowded, becoming confluent and covering large areas of the leaf surface.

Mycelium at first radiating, becoming more or less closely reticulate. Hyphae almost straight, dark olive buff to buffy brown, 4–5 $\mu$ thick, cells mostly 20–30 $\mu$ long, branching irregular, often opposite. Hyphopodia fairly numerous, alternate or unilateral, rarely opposite, straight, curved or hooked, usually erect, less frequently inclined towards the hypha, 12–20 $\mu$, usually 12·5–15 $\mu$ long, 2-celled; basal cell cylindrical, 4–10 $\mu$ long and 5 $\mu$ broad; apical cell variable, usually cylindrical to ovate, rounded above, sometimes truncate, sometimes sublobed and irregular in form, 7·5–11·5 $\mu$ long, 5–9 $\mu$, mostly 5–6 $\mu$ broad.

Pycnidia very numerous, often crowded, circular in outline or somewhat elongated, 75–120 $\mu$ diam. Basal layer hyaline, structure not evident. Covering membrane slightly convex, pellucid, buffy brown, becoming darker and subopaque in the centre, composed of straight, radiating hypha 2·5–4 $\mu$ thick, central cells almost cubical, marginal cells longer, up to 6 $\mu$ long; central cells breaking down irregularly at maturity. Conidia fairly numerous, oblong or ovate-oblong, buffy brown with a paler medial band, 15–21·5 × 7·5–10 $\mu$.

On *Eugenia natalitia* Sond., on leaves, Hogsback, *J. & M. Henderson*, 11340.

A number of larger, dimidiate bodies, 150–160 $\mu$ diam., are apparently immature thyriothecia, but no asci or spores were seen.

**Asterostomella Visci** Doidge nov. spec.

Colonies amphigenous, rather thin, dull black, circular to irregular in outline, scattered or rather closely crowded and becoming confluent, not sharply defined.

Mycelium reticulate. Hyphae snuff brown to cinnamon brown, almost straight or more or less undulating, 5–6 $\mu$ thick, closely septate, cells 10–17·5 $\mu$ long, branching irregular. Hyphopodia fairly numerous, unilateral or alternate, continuous, usually subglobose, less frequently briefly cylindrical, or sublobed and more or less irregular in form, 8–12 $\mu$ long and 7–9 $\mu$ broad.

Pycnidia numerous, circular in outline, often becoming confluent in small groups and flattened by lateral pressure, 50–120 $\mu$ diam. Basal layer hyaline, without recognisable structure. Covering membrane slightly convex, pellucid, snuff brown to cinnamon brown, formed of straight, radiating hyphae 4–6 $\mu$ thick, with cells almost cubical, 4–5 $\mu$ long, not fringed at the margin; central part developing numerous radiating cracks, running out almost to the margin, and finally breaking down irregularly. Conidia fairly numerous, snuff brown with a rather indistinct paler medial band, ovate, oblong or broadly ellipsoid, 15–21 × 10–12·5 $\mu$.

On *Viscum obscurum* Thunb., on leaves, Assegai Bush, Humansdorp Distr., *Doidge*, 17237; Langholm Estates, Bathurst, *Doidge*, 12366; Belmont Valley, Grahamstown, *Doidge*, 10951; Knysna, *Bottomley*, 32114, 32237.

## HOST INDEX BY FAMILIES.

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  - Echidnodes Hypolepidis.
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  - *Phragmothyrium Trichomanis.*

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## LATIN DESCRIPTIONS OF NEW SPECIES.

**Asterina atrosana** (nom. inv. Syd. Ludgo var. Kigeliae Ludgo comb. nov.

Syd. Asterina atrosana P. Henn. var. microspora Ludgo in Bothalia I (1924) p. 209.

Peltulae amphigenae epiphyllae. Mycelium ex hyphis subhyalinis vel luteo-virescentibus reticulatim expansis. Hyphopodia typo varii vel 6–20 μ longa, 4–9 μ lata; cellula basali plus minus cylindracea, 3–12·5 μ longa et 3–6 μ crassa. Thyriothecia numerosa, 170–240 μ diam., membrana tenui subhyalina, cellulis regulariter ex hyphis subhyalinis textis, 2–5 μ crassis arcuatis in parte centrali ca. 4–8 μ longis marginalibus paulo brevioribus elongatis compositi, ad peripheriam plus minus fimbriati. Sporae 8–10 μ longae, verruculosae. **Conidia 10–17·5 × 8·5–11·5 μ.**

Hab. in foliis *Kigeliae africanae* L., in silva Knysna, Cape Prov. (Ludgo).

**Asterina Bowmaniae** Ludgo nov. spec.

Peltulae epiphyllae, sparsae plus minus orbiculares, non-gregariae, 2–7 mm. diam. Mycelium ex hyphis tenuibus vel mediocribus tenuiter verrucosis laxe reticulatim expansis, olivaceo-brunneis, 3·5–4 μ crassis compositum; hyphopodia nec numerosa, subglobosa vel clavata, rarissima, longiter cylindracea v. subglobosa, 5–7·5 μ longa, 4·5–7 μ crassa, raro 9 μ lata. Thyriothecia sparsa, cellulis plerumque orbicularibus 10–15 μ diam. membranea tenuia fusca, cellulis 2–3 μ crassis hyalinis vel subhyalinis, margine regulariter hyalino crasso, cellulis radialibus 1·5–2 μ crassis hyalinis compositum, 2–4 μ crasso, margine pellucido crasso 7–10 μ longo compositi, peripheriae haud vel leviter fimbriati, in maturitate in fissuras parvas irregulariter fissi. Asci paucii, 8-spori, non semper bene developti, 60–77 × 30–37 μ. Sporae amphithecio elongato crassiusculo 1-septato, cellula superiore vix latiore quam inferiore, fuscae, 22–24 μ longae, cellula superiore 11–12·5 μ longa, 11–12·5 μ lata, inferiore 10–11·5 μ longa, ca. 9 μ lata.

Hab. in foliis *Dracophylli secundi* (Forst.) Druce, Knysna, Cape Prov. (Ludgo, 12·vii.).

**Asterina Bottomleyae** Ludgo nov. spec.

Peltulae amphigenae plerumque epiphyllae irregulariter dispersae, primitus plus minus orbiculares dein irregulariter lobatae usque 1 mm. diam., dein saepe confluentes magnas vel parum irregulares formantes. Mycelium ex hyphis laxe reticulatim expansis brunneis, 3–7·5 μ crassis compositum; hyphopodia varia, plerumque oppositi-bina, 4–9 μ longa, 3–7 μ crassa, cellula basali cylindracea v. subglobosa, 9–14 μ longa et 5·5–7·5 μ lata. Thyriothecia plus minus laxe dispersa, cellulis plerumque orbicularibus 12–14 μ vel raro 20 μ diam., cum margine vix ullo, ex hyphis radialibus in parte centrali quasi arcuatis, cellulis 2–3 μ crassis pellucido-brunneis plus minus irregulariter 1 μ crasso, compositum. Asci haud numerosi, 1–4-spori, saepe vel subglobosi, saepe 65–80 × 50–60 μ. Sporae amphithecio elongato, cellulis ambobus irregulariter 1-septatis, fuscae, cum septo brunneo, 22–30 μ longae, cellula superiore 17·5–20 μ diam., inferiore 15–17 μ.

Hab. in foliis *Ilicis mitis* L. Radlk., prope Mont-aux-Sources, leg. Bottomley, 20.iv.

**Asterina capparidicola** Ludgo nov. spec.

Peltulae amphigenae vel plerumque epiphyllae, arctae, primitus orbiculares, saepe confluentes irregulares vel parum irregulariter oblongae, confluendo saepe magnas et irregulares late patentes irregulares vel flexuosas et usque 7 mm. diam. Mycelium ex hyphis ca. 4 μ crassis, tenuiter verruculosis v. laevibus reticulatim dense expansis, olivaceo-brunneis compositum; hyphopodia numerosa, plerumque opposita, 2-cellularia, 10–20 μ longa, cellula basali subsphaerica v. late cylindracea, ca. 5 μ crassa et 5–9 μ longa, cellula superiore subsphaerica, 5·5–7·5 μ crassa. Thyriothecia dense dispersa, saepe vix regulariter orbicularia, 130–160 μ diam., membrana tenui fuscata, hyalino-granulosa, cellulis hyalinis tenuibus, primitus arcuatis (dein fere stellatim dehiscens, ex hyphis radialibus 6–8 μ crassis compositis, peripheriae plus minus fimbriatis. Asci globosi v. late ovati, sessiles, 62–65 × 57·5–67·5 μ. Sporae amphithecio elongato, olivaceo-brunneae, cellulis late rotundatae, 1-septatae, non vel vix constrictae, 22–27·5 μ longae, cellula superiore 12·5–15 μ longa et 11·5–13·5 μ lata, inferiore 10–12·5 μ longa et

10–11·5 μ lata, minute verrucoso-echinulatae. Pycnidia simul praesentia minora, usque 100 μ diam. Conidia ovata v. oblonga, olivaceo-brunnea, 17–25 × 12–15 μ, plerumque zonula hyalina aegre perspicua praedita.

Hab. in foliis *Capparidis Zeyheri* Turcz., Alexandria, leg. Doidge, 22361.

**Asterina diplocarpa** Cke. var. **Hibisci** Doidge nov. var.

Mycelium ex hyphis irregulariter radiantibus deinde laxe reticulate-ramosis, undulatis, 2·5–3·5 μ crassis compositum. Hyphopodia pauca, alternantia v. unilateralia, 5–11·5 μ longa, 7·5–15 μ lata. Thyriothecia numerosa, 100–130 μ diam. Asci subglobosi v. ovati, 25–33 × 22·5–25 μ. Sporae oblongae, circa medium septatae et constrictae, minute verruculosae, 17–20 × 9–10 μ; cellula superiore paullo latiore. Pycnidia numerosa, 70–80 μ diam.; conidia 16–18 × 13–15 μ. Alioque typo simul.

Hab. in foliis *Hibisci pedunculati* Cav., Van Staden's Pass, C.B.S., leg. Doidge, 17258.

**Asterina dissiliens** (Syd.) Doidge var. **senegalensis** Doidge nov. var.

Mycelium reticulatim ex hyphis valde undulatis, 4–5 μ crassis compositum; hyphopodia hemisphaerica, ovata v. ampullacea, inter dumerecta, usque 10 μ longa et lata. Sporae latiores, cellula superiore 11–11·5 μ lata, inferiore 9–10 μ lata. Alioque ut in typo.

Hab. in foliis *Gymnosporiae senegalensis*, Rikatli, Mozambique, leg. Junod, 11725.

**Asterina elegans** Doidge nov. spec.

Plagulae plerumque epiphyllae, atrae, densiuscule dispersae, ambitu plus minus orbiculares, usque 5 mm. diam., confluendo interdum majores et magnam folii partem occupantes. Mycelium ex hyphis reticulato-ramosis, rectiusculis v. leniter undulatis, olivaceo-brunneis, 3–6 μ crassis compositum. Hyphopodia numerosa, opposita, alternantia v. unilateralia, 2-cellularia, cylindracea, recta v. leniter curvata, 12–20 μ longa et 4–6 μ lata, cellula basali 5–7·5 μ longa, apicali integra, cylindracea, ad apicem leniter attenuata. Thyriothecia numerosa, dense dispersa, sat regulariter orbiculares, 130–170 μ diam.; membrana basali distincta, fumoso-griseola; strato tegente convexo, ex hyphis radiantibus, rectiusculis, cellularum in parte centrali fere isodiametricarum, 3·5–4 μ longarum et 3–4 μ laterum, marginem versus leniter elongatarum composito, in maturitate laciniis anguste triangularibus stellatim dehiscente, periphice fimbriato. Asci subglobosi vel ovati, sessiles, 8-spori, crasse tunicati, 45–50 × 35–42 μ. Sporae conglobatae brunneae, oblongae, circa medium septatae et constrictae, utrinque late rotundatae, 22–25 μ longae, verrucis acutiusculis dense obsitae, cellula superiore 11–12·5 μ lata, inferiore 9–10·5 μ lata. Pycnidia simul praesentia, 100–120 μ diam. Conidia brunnea, ovata, 20–25 × 12–15 μ.

Hab. in foliis *Capparidis citrifoliae* Lam., Winkle Spruit, Natal, leg. Doidge, 9010.

*Asterina papillata* Syd. affinis.

**Asterina Fleuryae** Doidge nov. spec.

Plagulae semper epiphyllae, tenues et parum perspicuae, minutae, 1–2·5 mm. diam., laxe v. densiuscule sparsae, saepe confluentes. Mycelium ex hyphis valde undulatis, 3–4·5 μ crassis compositum; hyphopodia haud numerosa, alternantia v. unilateralia, raro opposita, recta v. curvata, bicellularia, 9–19 μ longa, cellula basali 1·5–10 μ longa, cylindracea, recta v. curvata, 3–4 μ crassa v. plus minusve gibbosa et usque 7 μ crasse, apicali recta v. curvata, integra, 3–4 μ crassa, vel ad apicem dilatata, 2–4-lobulata et usque 10 μ lata. Thyriothecia laxe vel densiuscule dispersa, tunc saepe plura densissime aggregata et paullo conjuncta vel confluentia, ambitu orbicularia, saepe leniter irregularia, 100–130 μ diam.; membrana basali tenui, dilute grisea; strato tegente in centro e cellulis irregulariter angulosis, 2·5–3·5 μ diam. metientibus, marginem versus in series radiantes 2·5–3·5 μ latos dispositis, in maturitate in laciniis triangularibus dehiscente, ambitu plus minus fimbriato. Asci sat numerosi, 8-spori, ovati vel subglobosi, crasse et firme tunicati, 25·35 × 17–20 μ. Sporae conglobatae, oblongae, utrinque rotundatae, 1-septatae, leniter constrictae, pellucide olivaceo-brunneae, leves, 12–15 × 5–6·5 μ, cellulis subaequalibus v. cellula superiore parum latiore.

Hab. in foliis *Fleuryae* sp., Woodbush, Transvaal, leg. Doidge, 28349.

*Asterina Phenacis* Syd. affinis.

**Asterina Grewiae** Cke. var. **zonata** Doidge nov. var.

Hyphopodia frequentius uncinata vel sublobata quam in typo. Conidia ellipsoidea v. subclavata, 16–21·5 × 7·5–9 μ, olivaceo-brunnea, zonula hyalina perspicua praedita.

Hab. in foliis *Trimeriae trinervis* Harv., Howieson's Poort, prope Grahamstown, leg. Doidge, 12382.

**Asterina Knysnae** Doidge nov. spec.

Plagulae amphigenae, plus minus orbiculares, atro-grisea, usque 5 mm. diam. Mycelium laxe reticulatum, ex hyphis rectiusculis v. leniter tortuosis, olivaceo-brunneis, 6–7·5 μ crassis compositum. Hyphopodia numerosa, unilateralia v. alternantia, raro opposita, continua, cylindracea v. piriformia, recta v. curvata, 10–15 μ longa, 8–10 μ lata. Thyriothecia laxe v. densiuscule sparsa, ambitu plus minus orbicularia, 120–150 μ diam.; membrana basali distincta nulla; strato tegente leniter convexulo, ex hyphis radiantibus 2·5–5 μ crassis composito, in parte centrali opaco, marginem versus pellucido, periphice fimbriato, primitus omnino clauso, tandem in parte centrali irregulariter disrumpente. Asci paraphysati, subglobosi v. ovati, sessiles, 8-spori, 50–57·5 × 40–50 μ, firme crasseque tunicati. Sporae conglobatae, olivaceo-brunneae, oblongae, utrinque late rotundatae, 1-septatae, constrictae, minute denseque verruculosae, 30–35 μ longae, cellula superiore 16–17·5 μ lata, inferiore 14–15 μ lata. Paraphyses hyalinae, filiformes, 1·5–2 μ crassae.

Hab. in foliis *Canthii ciliati*, in silvis, Deepwalls, Knysna, leg. Doidge, 17226.

**Asterina natalitia** Doidge nov. spec.

Plagulae epiphyllae, sparsae, tenues, griseo-atrae, haud acute definitae, usque 5 mm. diam. Mycelium ex hyphis olivaceo-brunneis, rectiusculis v. leniter undulatis, plerumque 4–5 μ crassis, irregulariter remoteque ramosis compositum. Hyphopodia alternantia v. unilateralia v. nonnunquam opposita, sat numerosa, continua, cylindracea, raro ovata v. irregularia, 7·5–13 μ longa, 5–6·25 μ lata. Thyriothecia laxe vel densiuscule sparsa, ambitu plus minus orbicularia, 200–300 μ diam.; strato tegente convexo, in parte centrali opace atro-brunneo, ex hyphis radiantibus ad marginem pellucidem fimbriatum ca. 2·5–3 μ crassis composito, primitus omnino clauso, dein irregulariter dehiscente. Asci sat numerosi, 8-spori, ovati vel ellipsoidei, sessiles, 50–65 × 35–42·5 μ, firme crasseque tunicati. Sporae conglobatae, olivaceo-brunneae, oblongae, utrinque rotundatae, 1-septatae, sat valde constrictae, leves, 30–40 μ longae, cellula superiore 16–17·5 μ longa et 12·5–14 μ lata, inferiore 15–16 μ longa et 10–12·5 μ lata. Paraphyses filiformes, numerosae, 1·5–2·5 μ crassae, apice subclavatae et usque 5 μ crassae, ascos superantes.

Hab. in foliis *Eugeniae natalitiae*, in silvis, Woodbush, Transvaal, leg. Doidge, 17751.

**Asterina nodosa** Doidge nov. spec.

Plagulae epiphyllae, sparsae, ambitu plus minus orbiculares, usque 5 mm. diam., atrae. Mycelium ex hyphis reticulato-ramosis, toruloso-curvatis, brunneis, 3·75–7·5 μ crassis compositum. Hyphopodia alternantia v. unilateralia, continua, plerumque irregulariter cylindracea, raro recta, plerumque plus minus curvata, interdum integra, saepe toruiosa vel obtuse et varie lobata, 7–12·5 μ longa, 6–10 μ lata; rarissime 2-cellularia et usque 17·5 μ longa. Thyriothecia numerosa, laxe v. densiuscule disposita, ambitu plerumque torundata, 100–150 μ diam.; membrana basali indistincta; strato tegente alte convexulo, opace atro-brunneo, ex hyphis irregulariter radiantibus, 2·5–4 μ crassis, cellulis plerumque 5–10 μ longis composito. Asci late ovati v. subglobosi, sessiles, 8-spori, 37–45 × 35–40 μ. Sporae conglobatae, oblongae, utrinque rotundatae, circa medium septatae, constrictae, brunneae, minute et remote verruculoso-echinulatae, 23–28 μ longae, cellula superiore 12–15 μ, inferiore 11–12·5 μ lata.

Hab. in foliis *Ilicis* mitis (L.) Radlk., in silvis Woodville, George, leg. Doidge, 10943.

**Asterina Rinoreae** Doidge nov. spec.

Sub *Asterina ?vagans* Speg. in Trans. Roy. Soc. S. Afr. 8 (1920) p. 261.

Plagulae amphigenae, minutae v. plus minus effusae, tenues, parum perspicuae. Mycelium ex hyphis rectiusculis v. parum undulatis laxe reticulato-ramosis, ca. 5 μ crassis compositum. Hyphopodia sat numerosa, alternantia v. unilateralia, 2-cellularia, 9–17·5 μ longa, cellula basali cylindracea, 3–6 μ nonnunquam usque 12·5 μ longa et 5 μ lata, superiore plerumque irregulariter 2–3-lobata, 8–12·5 μ lata. Thyriothecia laxe dispersa, ambitu plus minus orbicularia, 100–160 μ diam.; membrana basali tenui, dilute brunneola; starte

tegente ex hyphis radiantibus, 3–3·5 μ latis, pellucide olivaceo-brunneis, cellulis 5–7·5 μ longis composito, in maturitate laciniis triangularibus irregulariter stellatim dehiscente, ad peripheriam fimbriato. Asci ovati v. subglobosi, 8-spori, 33–37 × 33–35 μ. Sporae, conglobatae, oblongae, utrinque late rotundatae, circa medium septatae et constrictae 20–24 × 11–12·5 μ, verruculoso-echinulatae. Pycnidia simul praesentia minora, 50–60 μ diam. Conidia brunnea, ovata v. pyriformia, 15–18 × 10–11 μ, zonula hyalina aegre perspicua praedita.

Hab. in foliis *Rinoreae natalensis*, Buccleuch, Natal, leg. Doidge, 9704.

**Asterina Saniculae** Doidge nov. spec.

Plagulae amphigenae, atrae, ambitu plus minus orbiculares, irregulariter dispersa, confluendo saepe majores. Mycelium ex hyphis reticulato-ramosis, olivaceo-brunneis, valde undulatis, 3–5 μ crassis compositum. Hyphopodia alternantia v. unilateralia, 2-cellularia, recta v. curvata, 10–15 μ longa, cellula basali 2·5–7·5 μ longa, cylindracea, 3·5–4 μ lata, apicali irregulariter 2–5-lobata, 7·5–11 μ lata. Thyriothecia in centro plagarum dense dispersa, haud raro dense conferta et omnino confluentia, ambitu plerumque orbidularia 100–130 μ diam.; membrana basali tenui, subhyalina; strato tegente convexulo, ex hyphis radiantibus atro-brunneis cellularum in parte centrali fere isodiametricarum, 2·5–5 μ longarum et 2·5–3·5 μ latarum, marginem versus leniter elongatarum et usque 8 μ longarum composito, in maturitate laciniis triangularibus stellatim dehiscente, periphice haud vel leniter fimbriato. Asci 8-spori, ovati v. subglobosi, firme crasseque tunicati, sessiles, 20–25 × 17·5–20 μ. Sporae conglobatae, dilute olivaceo-brunneae, oblongae, circe medium septatae et leniter constrictae, utrinque rotundatae, leves, 12·5–15 μ longae, cellula superiore 5–6·25 μ lata, inferiore saepe leniter anguatiore.

Hab. in foliis *Saniculae europaeae* L., Woodbush, Transvaal, leg. Doidge, 28331.

**Asterina Syzygii** Doidge nov. spec.

Sub *Parasterina brachystoma* (Rehm.) Theiss., in Trans. Roy. Soc. S. Afr. 8 (1920) p. 245.

Plagulae plerumque epiphyllae, atrae, crustaceae, ambitu plus minus orbiculares, usque 5 mm. diam. vel raro usque 10 mm. Mycelium ex hyphis radiantibus, castaneo-brunneis, rectiusculis v. plus minus tortuosis, 6–8 μ crassis, septatis, irregulariter ramosis compositum. Hyphopodia sat numerosa, alternantia v. unilateralia, breviter cylindracea, ovata v. subglobosa, 7–12·5 μ longa, 7–10 μ lata. Thyriothecia laxe v. dense dispersa, haud raro concentrice disposita, ambitu orbicularia vel plus minus angulata, 250–350 μ diam., rarius usque 400 μ, subinde confluentia; strato tegente leniter convexulo, in parte centrali opace atro, ad peripheriam tantum pellucide brunneo, ibique ex hyphis radiantibus, rectis v. subtortuosis, septatis, 3–5 μ crassis composito, in maturitate laciniis triangularibus stellatim dehiscente. Asci numerosi, 6–8-spori, late ellipsoidei v. ovati, sessiles, 60–75 × 37·5–45 μ, firme et crasse tunicati. Sporae oblongae, brunneae, utrinque rotundatae, circa medium septatae, vix constrictae, dense et distincte verruculosae, 27·5–35 × 14–17 μ, cellula inferiore plerumque leniter angustiore. Paraphyses numerosae, filiformes, septatae, 2–2·5 μ crassae.

Hab. in foliis *Syzygii Gerrardi*, in silvis, Woodbush, Transvaal, leg. Doidge, 17755.

**Asterina Trichocladi** Doidge nov. spec.

Plagulae epiphyllae, tenuissimae, griseo-atrae, plus minus orbiculares, laxe dispersae, usque 5 mm. diam., parum perspicuae. Mycelium tenue, laxe recticulatim ex hyphis pallide olivaceis, leniter undulatis, obscure septatis, 2·5–3·5 μ crassis compositum. Hyphopodia parce evoluta, solitaria, alternantia v. unilateralia, continua, semiglobosa, pulvinata, saepe plus minus depressa, cylindracea v. pyriformia, raro sublobata, 5–7·5 μ longa, 5–7 μ lata. Thyriothecia numerosa, sparsa, ambitu plus minus orbicularia, 250–380 μ diam.; membrana basali nulla; strato tegente ex hyphis radiantibus, sinuosis, 2·5–3·5 μ crassis, cellulis 5–7·5 μ longis composito, margine crenato haud fimbriato. Asci sat numerosi, 8-spori, oblongi v. subclavati, antice rotundati, postice subito in stipitem brevissimum contracti, 50–72·5 × 17–18 μ. Sporae distichae v. conglobatae, oblongae, pellucide olivaceae, utrinque rotundatae, 1-septatae, leniter constrictae, leves, 13–18 × 6–7 μ, cellulis subequalibus v. superiore paullo latiore. Paraphysoidae numerosae, fibrosae, mox mucosae.

Hab. in foliis *Trichocladi criniti*, in silvis Knysna, leg. Bottomley, 32231.

**Asterina Vepridis** Doidge nov. spec.

Plagulae amphigenae, irregulariter sparsae, ambitu plus minus orbiculares, usque 3 mm. diam., tenues, griseo-atrae. Mycelium ex hyphis laxe reticulato-ramosis, rectiusculis, olivaceo-brunneis, 3·5–5 μ crassis compositum. Hyphopodia sat numerosa, opposita, alternantia v. unilateralia, continua, pyriformia, recta v. leniter curvata, ad apicem attenuata, 7·5–11 μ longa, 4–5 μ lata. Thyriothecia numerosa, in centro plagularum dense dispersa, haud raro 2–4 vel plun conferta et onmino confluentia, singula 160–200 μ diam., ambitu plerumque orbicularia ; membrana basali distincta nulla ; strato tegente olivaceo-brunneo, convexulo, ex hyphis radiantibus, rectiusculis, 3–4 μ crassis, cellularum in parte centrali fere isodiametricatum, 3–5 μ longarum composito, in maturitate laciniis triangularibus stelatim dehiscente, periphice breviter fimbriato. Asci 8-spori, subglobosi vel ovati, sessiles, 50–52·5 × 45–47·5 μ. Sporae conglobatae, oblongae, utrinque rotundatae, medio vel paullo infra medium septatae et constrictae, olivaceo-brunneae. leves, 25–29 μ longae, cellula superiore 15–16 μ longa et 14–15 μ lata, inferiore 11–14 μ longa et 11–12·5 μ lata.

Hab. in foliis *Vepridis lanceolatae*, in silvis Xumeni, prope Donnybrook, leg. Doidge, 2774 b.

**Asterina Woodii** Doidge nov. spec.

Plagulae amphigenae, irregulariter sparsae, atrae, tenues, ambitu irregulares, usque 6 mm. diam., subinde confluendo majores et saepe magnam folii partem occupantes. Mycelium ex hyphis remote ramosis et laxe reticulatis, pellucide brunneis, rectis v. leniter undulatis, 3–5 μ crassis compositum. Hyphopodia modice copiosa, opposita, alternantia v. unilateralia, 2-cellularia, plus minus cylindracea sed uncinata v. varie curvata, raro sublobata, 10–17·5 μ longa et 3·5–5 μ lata, cellula inferiore cylindracea, 2·5–10 μ longa. Thyriothecia densiuscule sparsa vel 2–8 dense conferta, ambitu orbicularia v. e mutua pressione irregularia, 120–160 μ diam., primitus omnino clauso, deinde stellatim dehiscentia, tandem fere ad marginem aperta ; membrana basali distincta, fumoso-griseola ; strato tegente pellucide brunneo, ex hyphis radiantibus, rectiusculis, 2–3 μ crassis composito, periphice breviter fimbriato. Asci ovati v. subglobosi, 8-spori, 30–37·5 × 22·5–27·5 μ, sessiles, in massa mucosa ochracea inclusi. Sporae conglobatae, oblongae, utrinque rotundatae, brunneae, circa medium valde constrictae, 22·5–25 × 10–12·5 μ, cellulis ellipsoideis, superiore leniter latiore, in maturitate opace atro-brunneae et echinulis grossiusculis dense obsitis.

Hab. in foliis *Capparidis Gueinzii*, Natal, leg. Medley Wood, (Wood 6458a) 9524a.,

**Asterina xumenensis** Doidge nov. spec.

Plagulae amphigenae et caulicolae, tenues, parum perspicuae, irregulariter sparsae usque 1 mm. diam. Mycelium ex hyphis irregulariter laxeque reticulato-ramosis, plus minus undulatis, 2·5–3·5 μ crassis, obscure septatis compositum. Hyphopodia sat numerosa, solitaria, unilateralia v. alternantia, raro opposita, continua, rarissime 2-cellularia, quoad formam sat irregularia, plerumque 5–11 μ longa et 5–10 μ lata, plus minus 2–4-lobata, raro etiam subcylindracea, sinuosa. Thyriothecia sparsa v. aggregata, haud raro 2–3 vel plura dense conferta et omnino confluentia, singula ambitu plerumque orbicularia, 65–100 μ diam. ; membrana basali distincta nulla ; strato tegente convexulo, atro-brunneo, primitus clauso dein stellatim dehiscente, ex hyphid radiantibus 2 2·5 μ crassis, breviter articulatis composito, periphice fimbriato. Asci sat numerosa, ovati vel ovato-globosi, sessiles, 8-spori, 18–20 × 11–16 μ. Sporae conglobatae, pellucide olivaceo-brunneae, leves, oblongae, 1-septatae, leniter constrictae, utrinque rotundatae, 11–12·5 × 5–6 μ, postice paullo attenuatae. Pycnidia simul praesentia, 37·5–50 μ diam. Conidia oblonga, ellipsoidea v. subclavata, olivaceo-brunnea, zonula hyalina praedita, 10–15 × 4–6 μ.

Hab. in foliis caulisque *Lobeliae stellarioidis*, in silvis, Xumeni, prope Donnybrook, leg. Morgan et Doidge, 30483.

**Asterina Zeyheri** Doidge nov. spec.

Plagulae epiphyllae, atrae, plus minus orbiculares, usque 5 mm. diam. Mycelium ex hyphis radiantibus, rectiusculis v. leniter undulatis, olivaceo-brunneis, 5–6 μ crassis, irregulariter ramosis et anastomosantibus compositum. Hyphopodia sat numerosa, unilateralia v. alternantia, breviter cylindracea v. ovata, 7·5–15 μ longa et 7·5–9 μ lata. Thyriothecia plus minus dense disposita, ambitu orbicularia, 250–350 μ diam., subinde

confluentia ; strato tegente convexulo, in parte centrali opace atro-brunneae, ex hyphis radiantibus, tortuosis, ad marginem latum pellucidem 3–5 μ crassis composito, primitus omnino clauso, in maturitate irregulariter stellatim dehiscente. Asci numerosi ovati vel late ellipsoidei, sessiles, 8-spori, 67·5–80 × 40–45 μ, firme crasseque tunicati. Sporae conglobatae, oblongae, utrinque late rotundatae, 1-septatae, valde constrictae, olivaceo-brunneae, leves, 30–39 μ longae, cellula superiore 15–20 μ longa et 14–16 μ lata, inferiore 11–19 μ longa et 12·5–15 μ lata. Paraphyses numerosae, hyalinae, filiformes, ascos superantes, ca. 1 μ crassae.

Hab. in foliis *Eugeniae Zeyheri*, in silvis, Alexandria, leg. Doidge, 22357.

**Asterinella Tecleae** Doidge nov. spec.

Plagulae hypophyllae, sparsae, griseo-atrae, haud acute definitae. Mycelium tenue, ex hyphis reticulato-ramosis, pellucide olivaceo-brunneis, obscure septatis, plerumque 2–2·5 μ crassis compositum ; hyphopodia nulla. Thyriothecia sparsa v. rarius 2–4 conferta et confluentia, ambitu orbicularia, 200–220 μ diam. ; strato tegente leniter convexulo, ex hyphis radiantibus, pellucide olivaceo-brunneis, 2–3 μ crassis, cellularum in parte centrali 4–6 μ longis, marginem versus elongatarum et usque 10 μ longarum composito, in maturitate laciniis triangular, bus-stellatim dehiscente, periphice breviter fimbriato. Asci sat numerosi (usque 20), 8-spori, subglobosi v. ovati, sessiles, 22–37·5 × 25 μ, firme tunicati. Sporae conglobatae, subclavatae, 1-septatae, haud vel leniter constrictae, antice rotundatae, postice plerumque attenuatae, 20–26·5 μ longae, cellula superiore ovata, 11–14 μ longa et 7·5–10 μ lata, inferiore plus minus cuneata, 9–12·5 μ longa et ad septum 6–8 μ lata. Pycnidia numerosa, thyriotheciis similia. Conidia hyalina, cylindracea, recta v. leniter curvata, utrinque obtusa, 7-septatae, 45–50 μ longa, 3·5–5 μ lata.

Hab. in foliis *Tecleae natalensis*, in silvis, Heanertsburg, leg. Doidge, 17783.

**Asterolibertia megathyria** var. **Randiae** Doidge nov. var.

Mycelium ex hyphis 3–4 μ crassis, nodis 5–8 μ diam., compositum. Thyriothecia 75–100 μ diam. Asci 4-spori, ovati v. subclavati, 22–28 × 12–15 μ. Sporae oblongae, 15–18 μ longae, cellula superiore 5–7·5 μ longa et 5–6·5 μ lata, inferiore 9–11 μ longa et 5 μ lata. Alioque typo similis.

Hab. in foliis *Randiae dumetorum*, Lemana, Transvaal, leg. Doidge, 1792.

**Asterostomella eugenicola** Doidge nov. spec.

Plagulae amphigenae, atrae, irregulariter dispersae, primitus plus minus orbiculares usque 4 mm. diam., dein saepe confluentes majores. Mycelium reticulato-ramosum, ex hyphis rectiusculis, pellucide olivaceo-brunneis, 4–5 μ crassis, cellulis, 20–30 μ longis compositum. Hyphopodia modice copiosa, alternantia v. unilateralia, raro opposita, bicellularia, recta v. curvata, 12–20 μ longa ; cellula basali breviter cylindracea, plerumque 4–6 μ, interdum usque 10 μ longa, ca. 5 μ lata, apicali cylindricae v. ovata, rarius truncata, sublobata v. irregularia, 7·5–11·5 μ longa, plerumque 5–6 μ lata, interdum usque 9 μ lata. Pycnidia numerosa, equaliter densiusculeque dispersa, ambitu plerumque orbicularia, 75–120 μ diam. ; strato tegente leniter convexo, ex hyphis radiantibus, rectis, crebre septati, in parte centrali 2·5–4 μ longis et latis, peripheriam versus leniter elongatis usque 6 μ longis, pellucide atro-brunneis composito, margine breviter fimbriato. Conidia sat numerosa, ovata v. ovato-oblonga, continua, brunnea, centro zonula subhyalina praedita, 15–21·5 × 7·5–10 μ.

Hab. in foliis *Eugeniae natalitiae*, Hogsback, leg. J. et M. Henderson, 11340.

**Asterostomella Visci** Doidge nov. spec.

Plagulae amphigenae, tenues, plus minus orbiculares v. irregulares, non vel vix determinatae, confluentes, atrae. Mycelium reticulato-ramosum, ex hyphis rectiusculis vel plus minus undulatis, brunneis, septatis, 5–6 μ crassis, cellulis 10–17·5 μ longis compositum. Hyphopodia sat numerosa, unilateralia v. alternantia, continua, plerumque subglobosa, rarius breviter cylindracea v. sublobata, 8–12 μ longa, 7–9 μ lata. Pycnidia numerosa, densiusculo dispersa, ambitu orbicularia, saepe confluentia, 50–120 μ diam. ; strato tegente leniter convexo, pellucide brunneo, ex hyphis radiantibus 4–6 μ crassis, crebre septatis, articulis 4–5 μ longis composito, margine haud fimbriato. Conidia sat numerosa, continua, brunnea, centro semper zonula subhyalina plus minus distincta praedita, ovata, oblonga v. late ellipsoidea, 15–21 × 10–12·5 μ.

Hab. in foliis *Visci obscuri*, Assegai Bush, leg. Doidge, 17237.

**Calopeltis Jasmini** Doidge nov. spec.

Mycelium liberum nullum. Thyriothecia semper epiphylla, ambitu plus minus orbicularia vel angulata, 100–150 μ diam., crustas superficiales 2–2·5 mm. diam., atras, orbiculares, sparsas formantia, minora et juniora saepe circulo crustas circumdantia, sine maculis; strato tegente e membranis singulis thyriotheciorum constante; membranae singulae convexae, ex hyphis radiantibus plus minus maeandrice curvatis compositae, centro dilutiores ibique pellucide olivaceo-brunneae radiatim e cellulis 2–3 μ longis, 2–2·5 μ latis, tenuiter tunicatis compositae, primitus clausae, tandem poro irregulari 15–20 μ lato apertae; contextu membranae singulae peripheriam versus e cellulis atro-brunneis usque 15 μ longis composito. Asci clavati v. ellipsoidei ad apicem late rotundatum leniter uncrassati, basim versus attenuati, sessiles, firme tunicati, 8-spori, 40–50 × 12·5–15 μ. Sporae plus minus distichae, oblongo-clavatae, ad apicem late rotundatae, basim versus sensim attenuatae, 1-septatae, haud vel vix constrictae, 12·5–16 μ longae, cellula superiore 4–5 μ longa et 4·5–5 μ lata, inferiore 7·5–10 μ longa, ad septum 3·75–4·5 μ lata. Paraphysoidae parce evolutae, fibrosae.

Hab. in foliis *Jasmini streptopi*, Durban, leg. Medley Wood, 9516.

**Ferrarisia Jasmini** Doidge nov. spec.

Mycelium liberum nullum. Thyriothecia amphigena, plerumque epiphylla, sparsa vel greges plus minus orbiculares, saepe confluentes, usque 7 mm. diam. metientes, atros formantia; singula vel saepe dense stipata et connexa, ambitu orbicularia subinde obtuse angulata v. irregularia, 120–200 μ diam.; strato tegente convexulo, ex hyphis opace atrobrunneis, radiantibus, plus minus sinuosis, 3–4 μ crassis, breviter articulatis (articulis 5–8 μ longis) composito, ad peripheriam irregulari vel breviter fimbriato, omnino clauso, in maturitate laciniis ca. 3–5, triangularibus ad marginem disrumpente. Asci pauci, late ellipsoidei v. ovati, 8-spori, firme tunicati, ad apicem late rotundati et leniter incrassati, 35–40 × 25–35 μ. Sporae conglobatae v. indistincte tristichae, oblongae, utrinque rotundatae, 1-septatae, constrictae, brunneae, leves, 22–25 μ longae, cellula superiore 12·5–14 μ longa et 10–11·5 μ lata, inferiore 10–11·5 μ longa et 7·5–10 μ lata. Paraphysoidae indistincte fibrosae, mox mucosae.

Hab. in foliis *Jasmini angularis*, Kentani, leg. Pegler, 2288.

**Lembosia Wageri** Doidge nov. spec.

Plagulae epiphyllae, atrae, per totam folii superficiem laxe vel densiuscule et sat equaliter distributae, haud raro confluentes et magnam folii partem occupantes, ambitu irregularos, usque ca. 3 mm. diam., haud acute definitae. Mycelium ex hyphis plus minus undulatis, dilute olivaceo-brunneis, indistincte septatis, 2·5–4 μ crassis compositum. Hyphopodia parce evoluta, solitaria, continua vel 2-cellularia, valde irregularia, plerumque plus minus lobata, 6–10 μ longa, 5–8 μ lata. Thyriothecia plerumque dense dispersa, haud raro plura dense conferta et plus minus connata, oblonga, recta v. curvata, 200–300 μ longa et 80–120 μ lata, rima longitudinali dehiscentia, vel orbicularia, 120–150 μ diam., stellatim dehiscentia; strato basali tenui, subhyalino; strato tegente convexulo, pellucide brunneo, ex hyphis radiantibus 2–3 μ crassis, cellulis 4–6 μ longis composito, periphice plus minus fimbriato. Asci numerosi, ovato-globosi vel ovati, sessiles, 6–8-spori, firme crasseque tunicati, 23–30 × 16–20 μ. Sporae conglobatae, clavato-oblongae, antice rotundatae, postice leniter attenuatae, 1-septatae, haud vel vix constrictae, leves, dilute olivaceo-brunneae 15–17 μ longae, cellula superiore subglobosa, 6–6·25 μ longa, 5·5–6·25 μ lata, inferiore 8·75–11 μ longa, ad septum ca. 5 μ lata.

Hab. in foliis *Tecleae natalensis*, Umhlanga Rocks, Natal, leg. V. A. Wager, 32472.

**Lembosina Rawsoniae** Doidge nov. spec.

Mycelium liberum absens. Thyriothecia hypophylla, irregulariter et laxe vel densiuscule dispersa, subinde 2–4 densius disposita tunc praecipue in formam Y, L vel X connexa, oblonga vel linearia, utrinque leniter sed distincte attenuata, obyusa, 200–450 μ longa, plerumque 250–300 μ longa, 80–100 μ lata, recta vel leniter curvata; membrana basali subhyalina sine structura distincta; strato tegente leniter convexulo, opace atro-brunneo, ex hyphis radiantibus, leniter undulatis 1–1·5 μ crassis, breviuscule articulatis, peripheriam versus pellucide olivaceo-brunneis composito, periphice haud fimbriato, in maturitate rima longitudinali dehiscentia. Asci copiosi, ovati v. clavato-oblongi, antice late rotundati, sessiles v. subsessiles, 8-spori, ca. 15–20 × 7–10 μ. Sporae subdistichae v. conglobatae,

oblongae v. subclavatae, utrinque obtusae, antice laet rotundatae, postice leniter attenuatae, 1-septatae, haud vel vix constrictae, ex hyalino pellucide olivaceo-brunneae, leves, 7–10 × 2·5–3 $\mu$. Paraphysoidae fibrosae, sat persistentes.

Hab. in foliis *Rawsoniae lucidae*, in silvis, Eshowe, leg. Gerstner, 32662.

## EXPLANATION OF PLATES.

In most of the plates the same method has been followed : in the upper half there is a low power drawing of part of a colony to show as far as possible the general habit of the fungus. (× ca 150) .Below there are detailed drawings of part of the covering membrane of the thyriothecium, hyphae, hyphopodia, ascospores and conidia when the latter are present (× 460).

In Plates II, III, LXV and LXXI there is no low power drawing, all × 460. Plate LXVI consists of drawings of sections through leaves of *Eucalyptus* spp. infected with *Lembosiopsis eucalyptina* (× 460). For further explanation see text.

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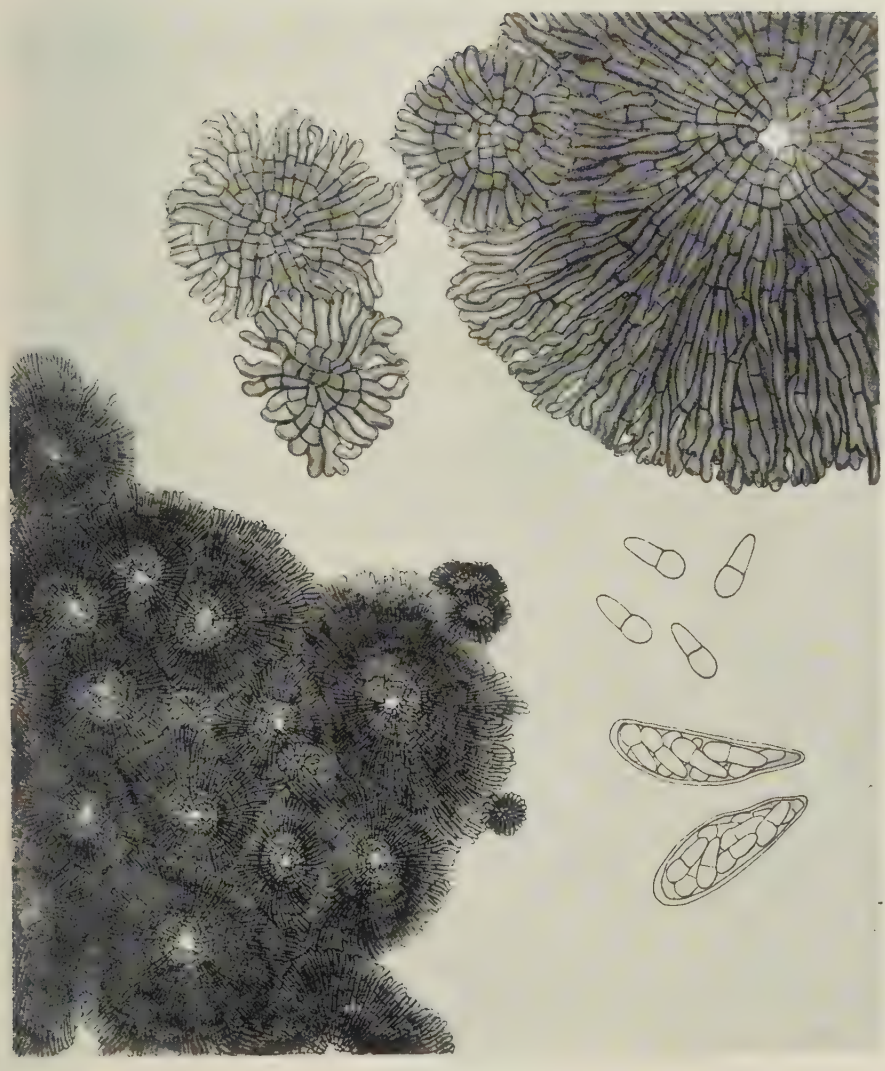

PLATE I.
*Calopeltis Jasmini.*

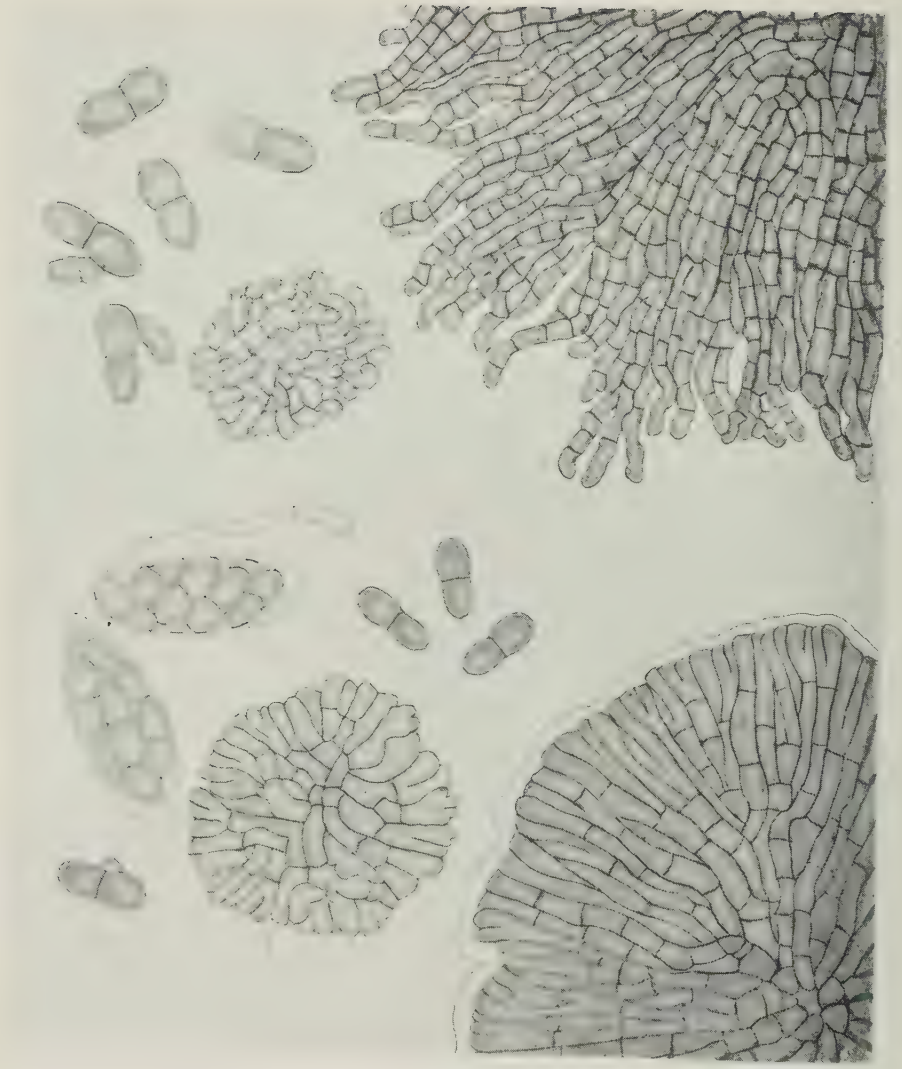

PLATE II.

Above (*a*) *Microthyrium ranulisporum.*
Below (*b*) *Microthyrium maculicolum.*
Plates II and III have been reversed.

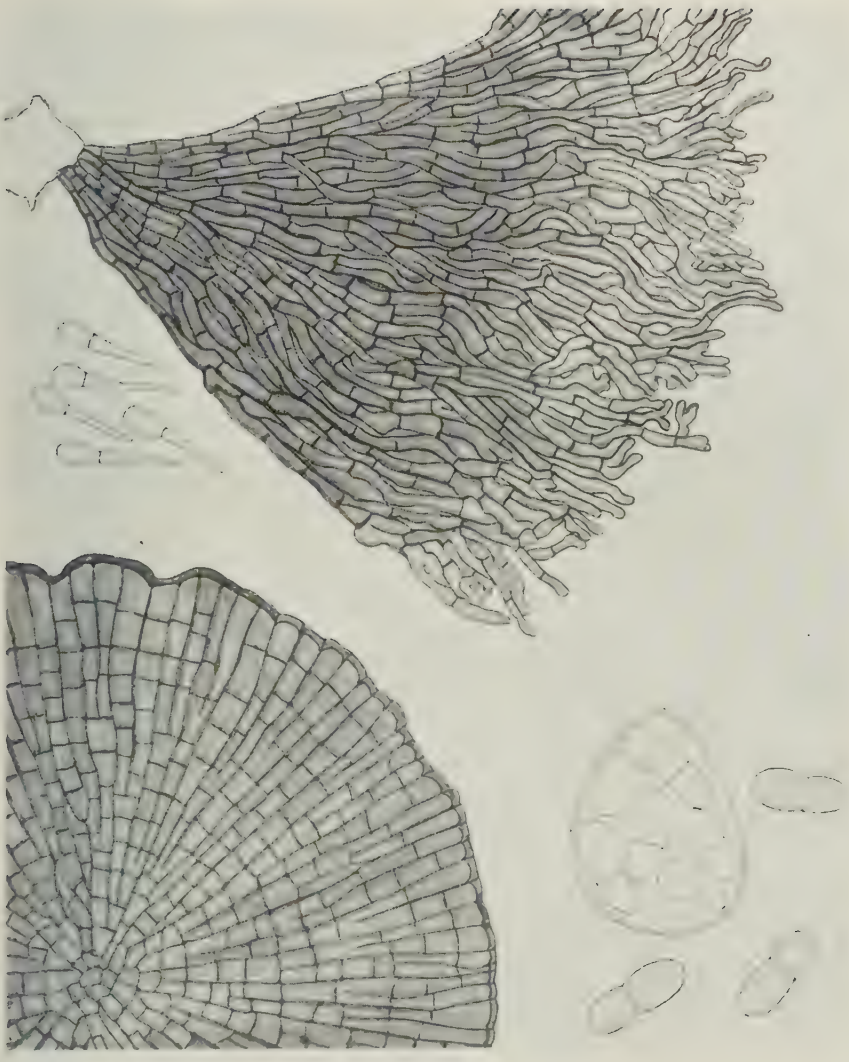

PLATE III.

Above (*a*) *Ferrarisia Jasmini.*

Below (*b*) *Palawaniella orbiculata=Seynesia orbiculata.*

Plates II and III have been reversed.

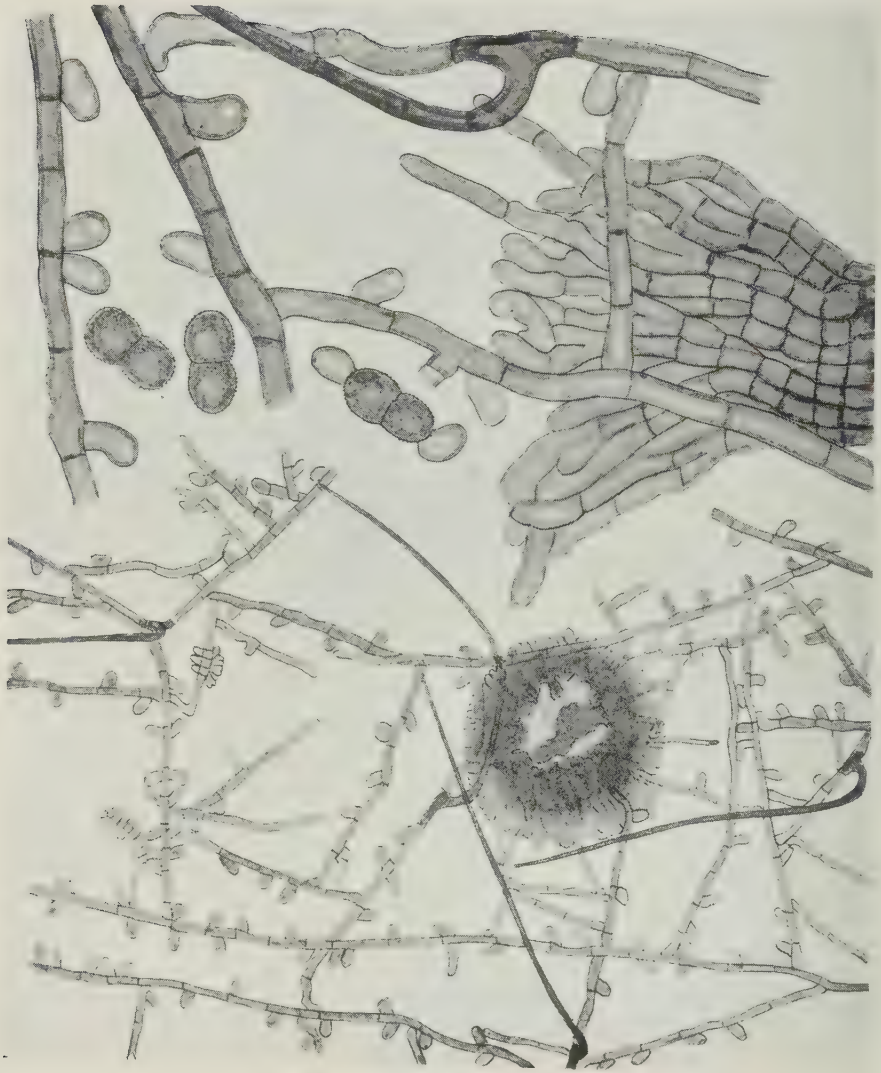

PLATE IV.
*Trichasterina Popowiae.*

PLATE V.
*Asterina pemphidioides.*

PLATE VI.
*Asterina Oncinotidis.*

PLATE VII.
*Asterina Zeyheri.*

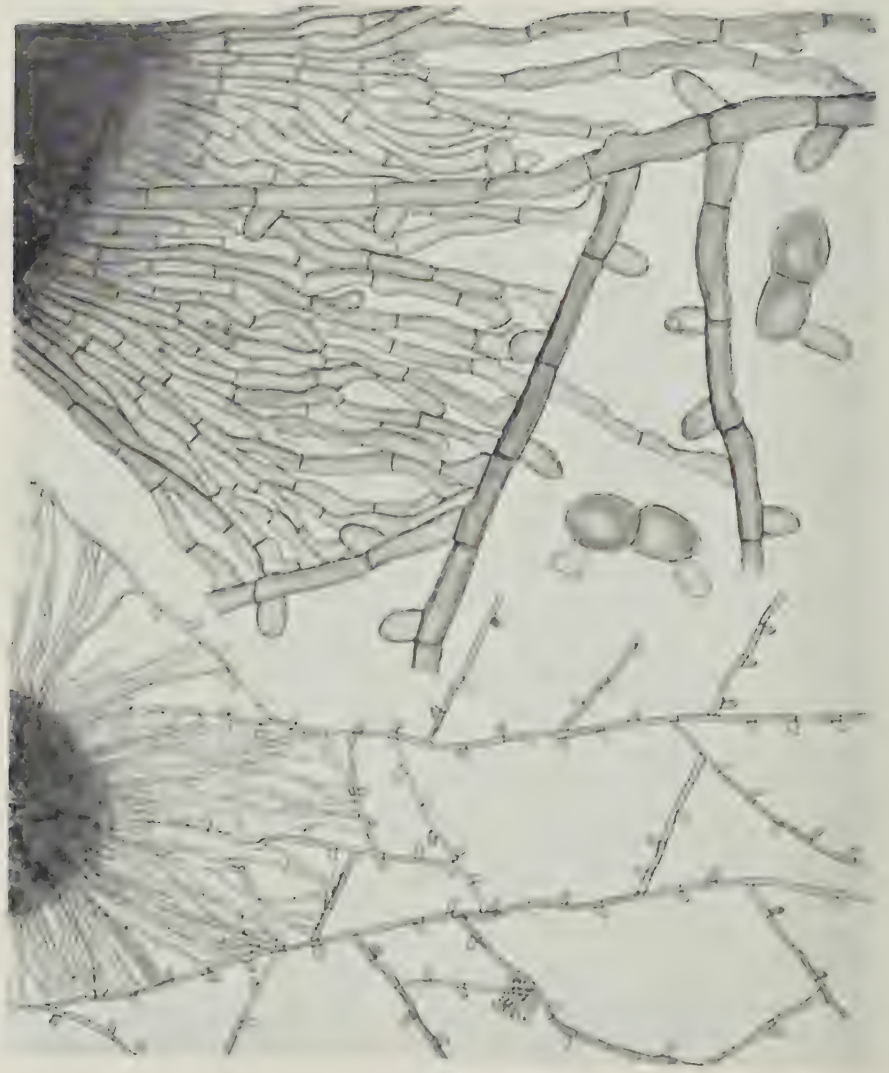

PLATE VIII.
*Asterina natalitia.*

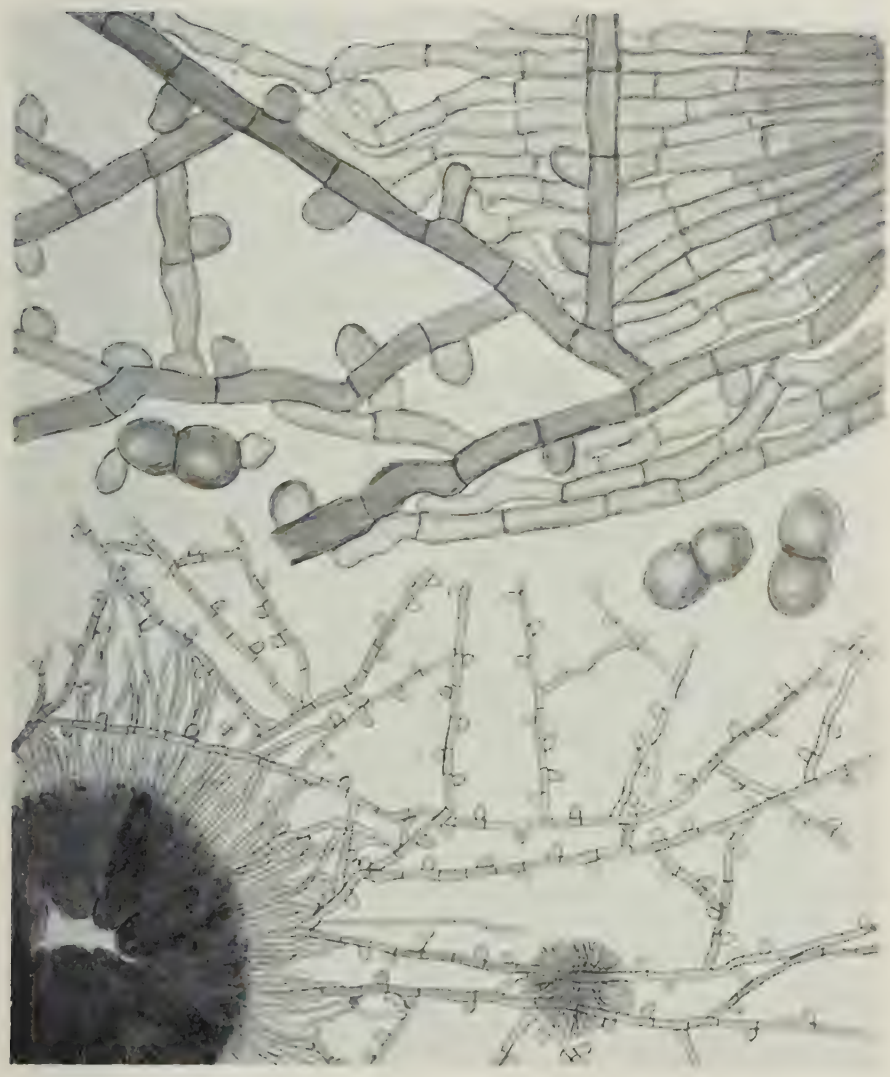

PLATE IX.
*Asterina Oxyanthae.*

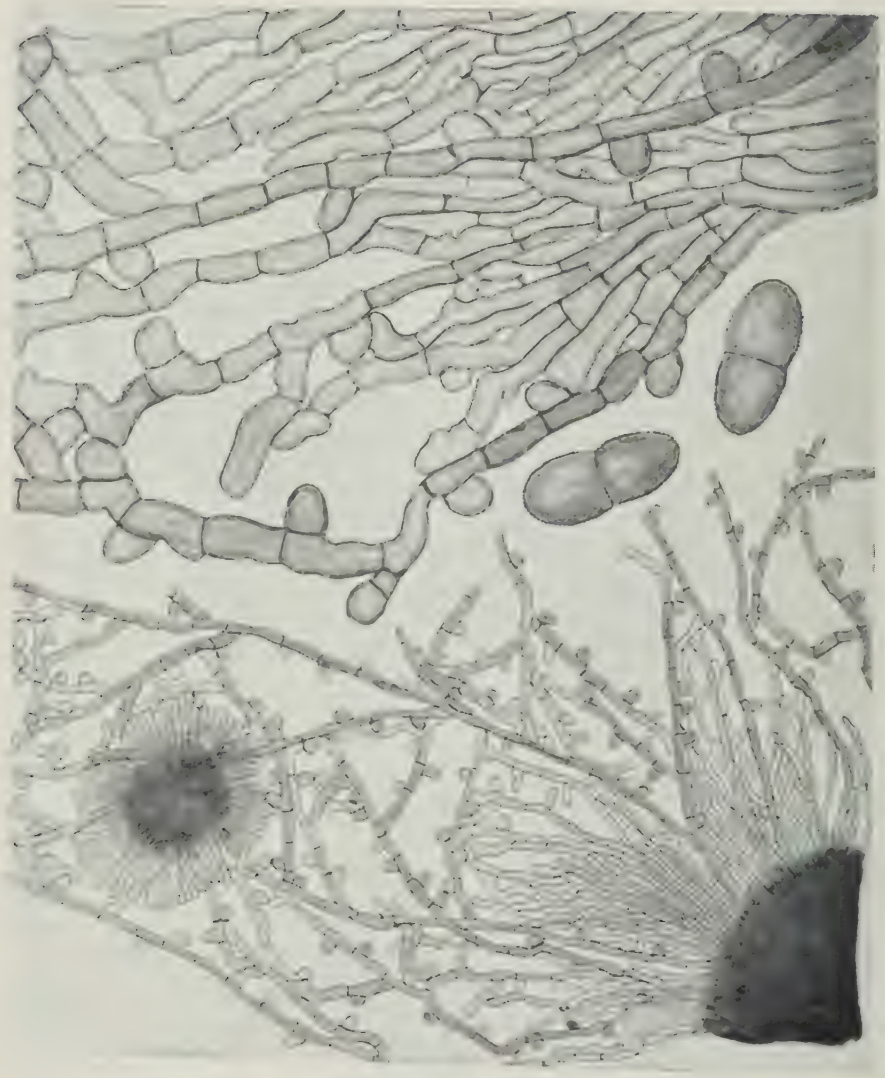

PLATE X.
*Asterina Zyzygii.*

PLATE XI.
*Asterina Knysnae.*

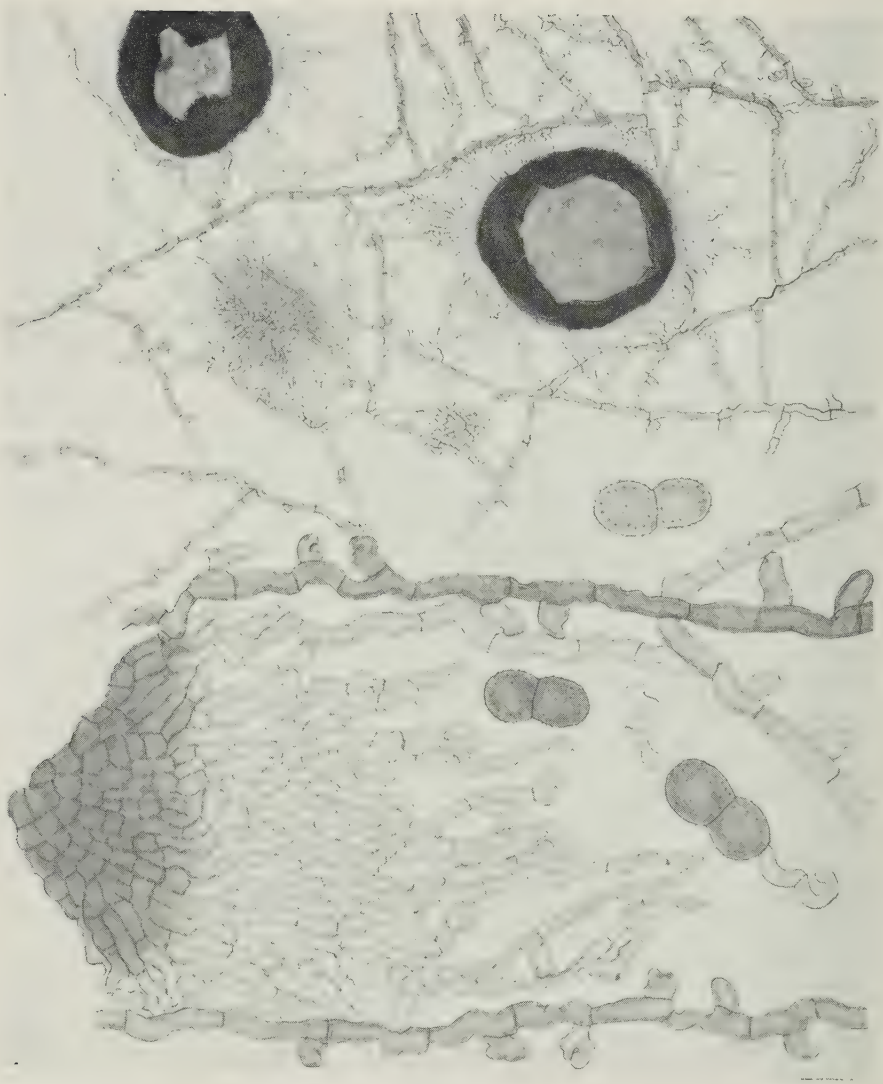

PLATE XII.
*Asterina nodosa.*

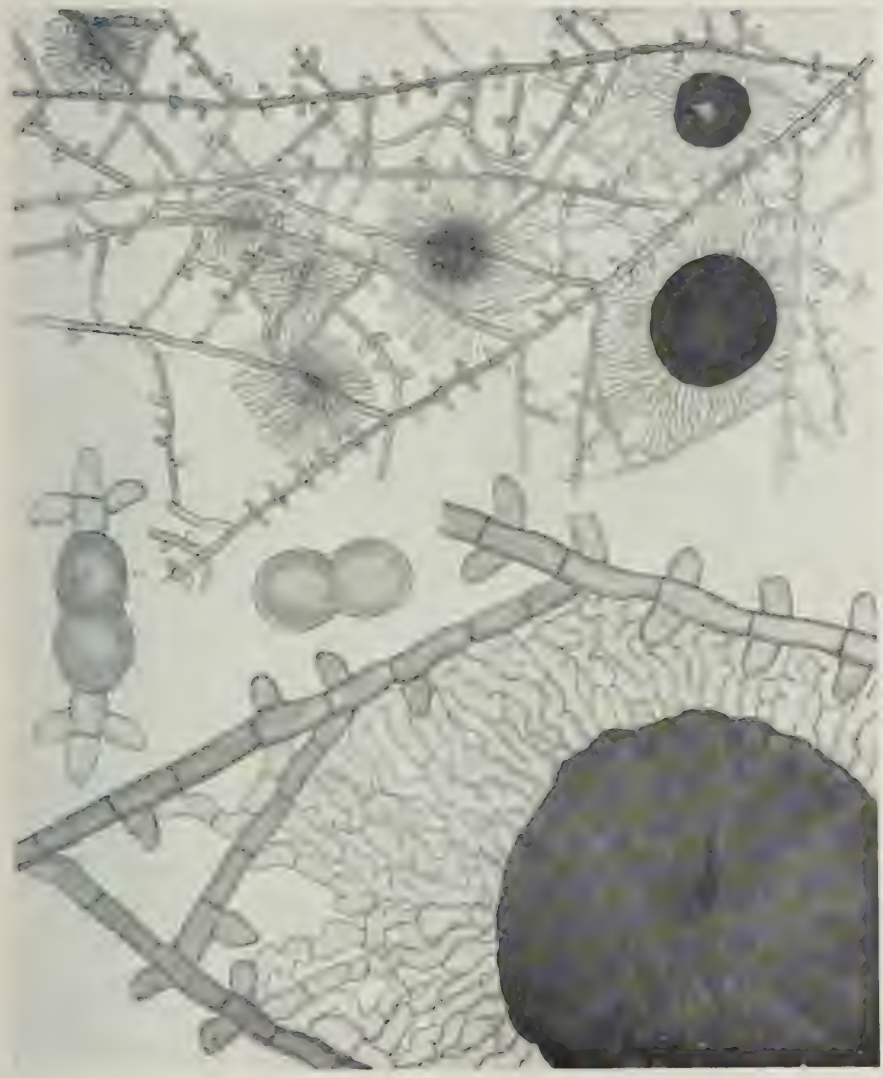

PLATE XIII.
*Asterina Bottomleyae.*

PLATE XIV.
*Asterina secamonicola.*

PLATE XV.
*Asterina inconspicua.*

PLATE XVI.
*Asterina dissiliens.*

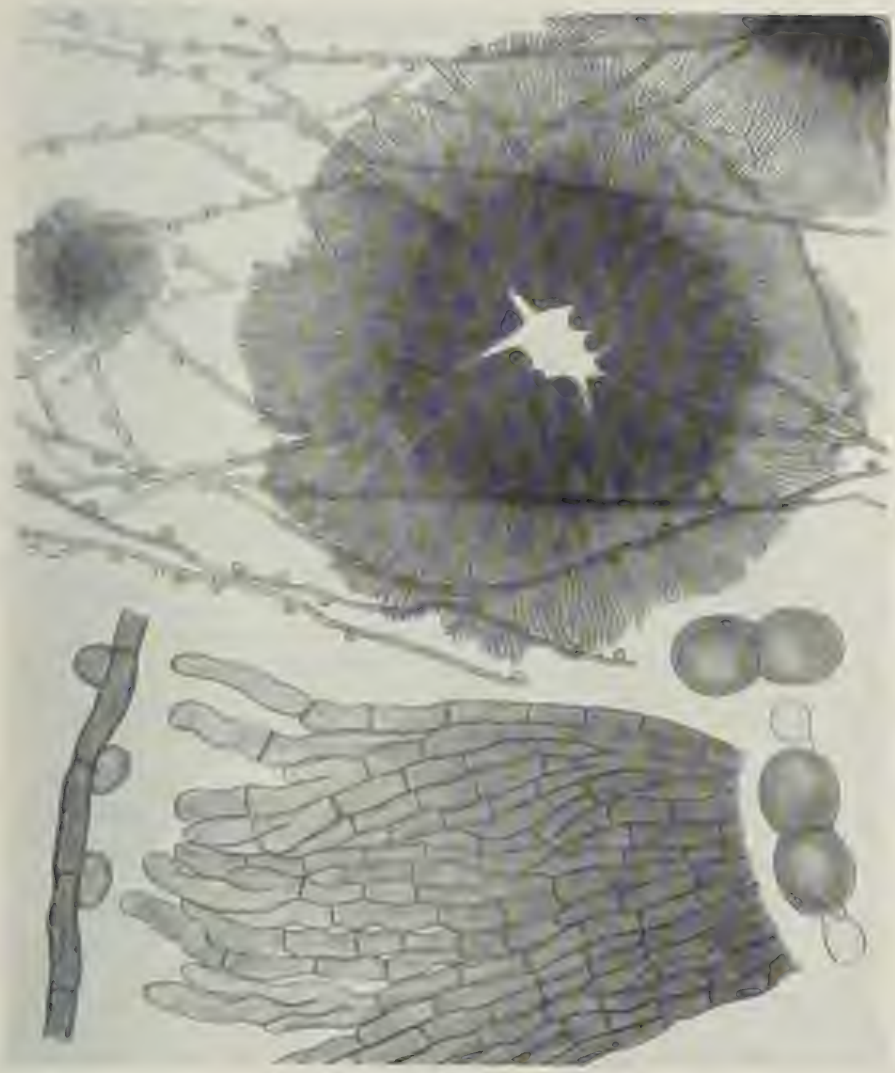

PLATE XVII.
*Asterina robusta.*

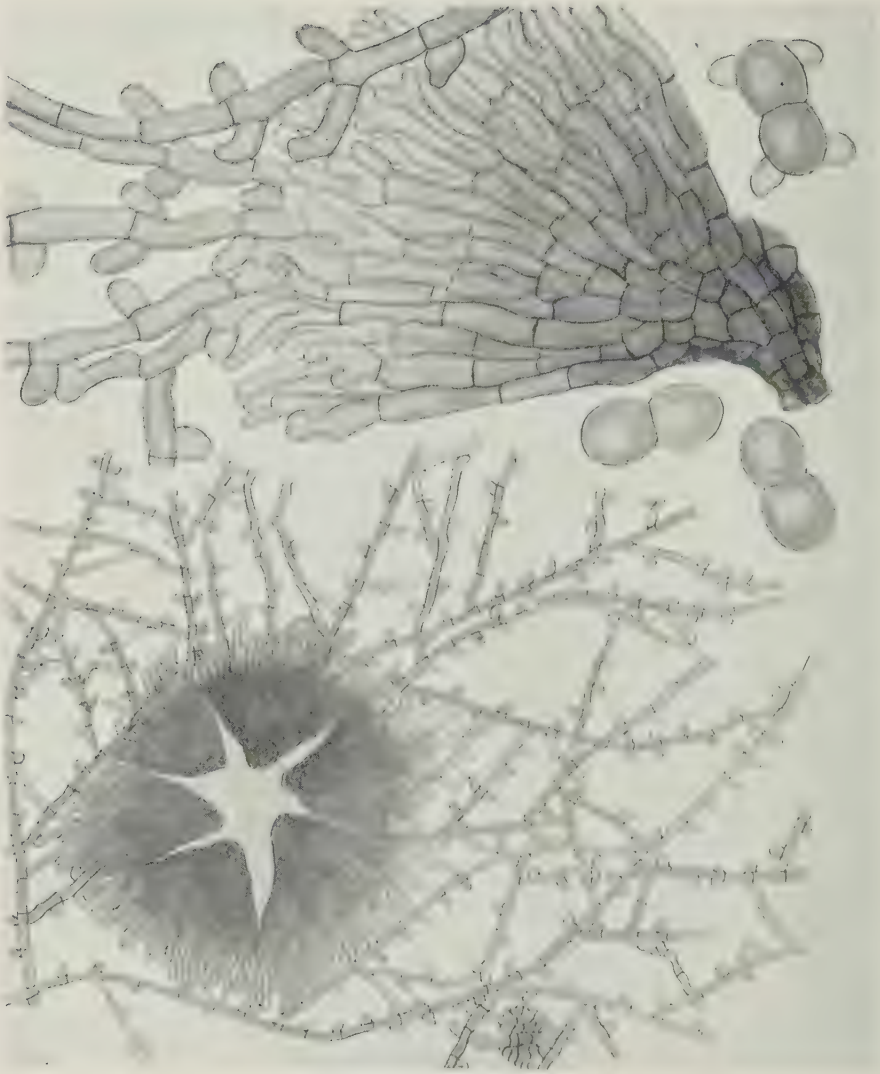

PLATE XVIII.
*Asterina opaca.*

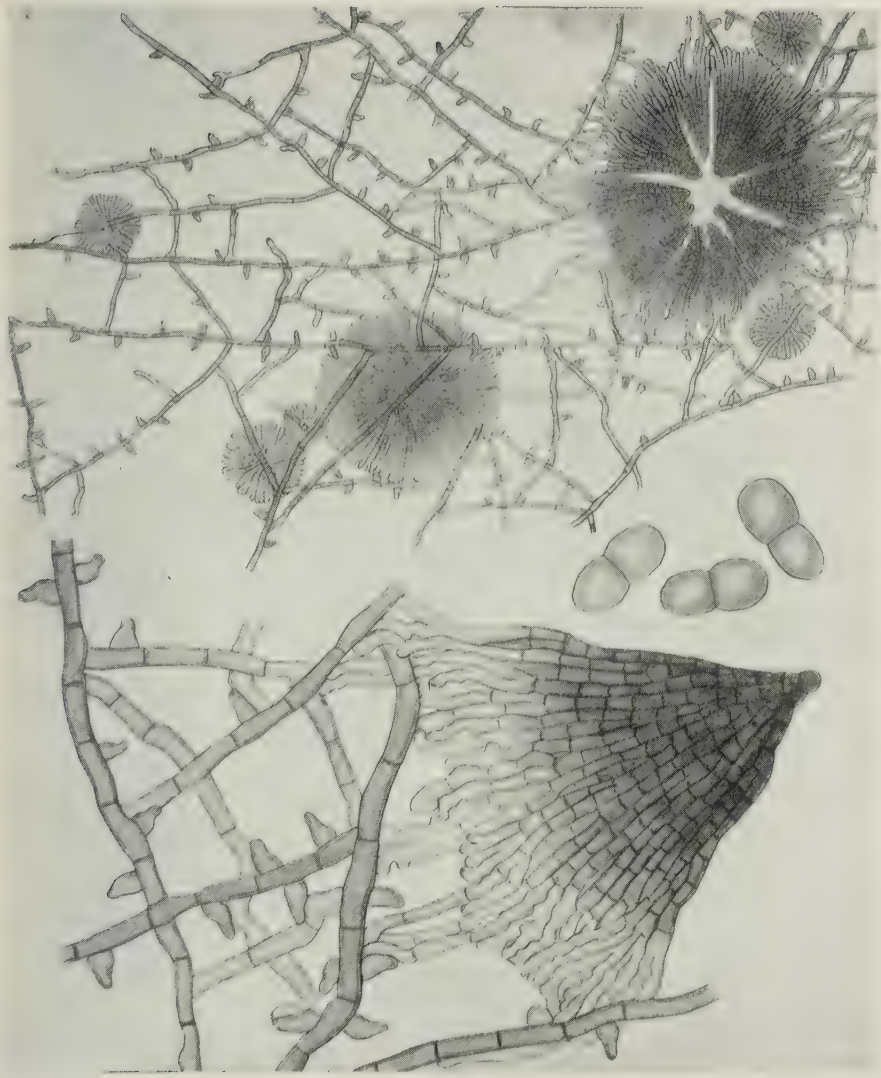

PLATE XIX.
*Asterina Vepridis.*

PLATE XX.
*Asterina Hendersoni.*

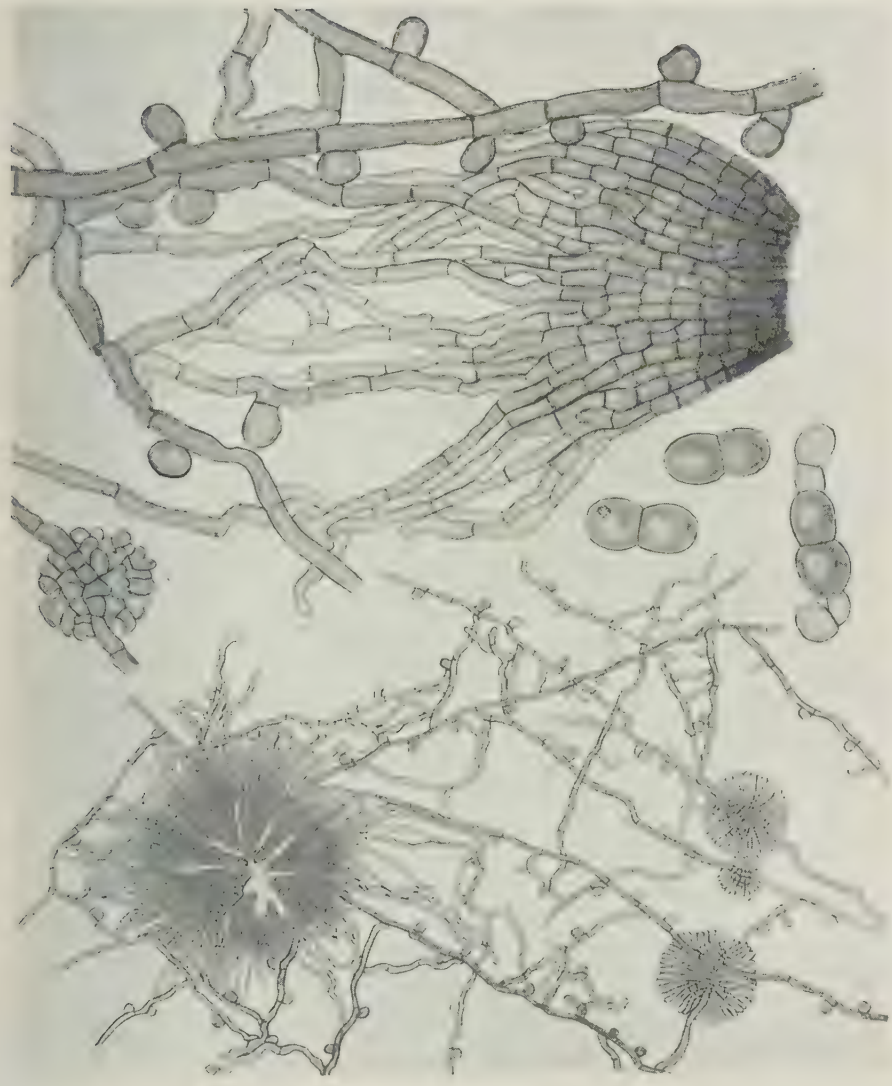

PLATE XXI.
*Asterina ferruginosa.*

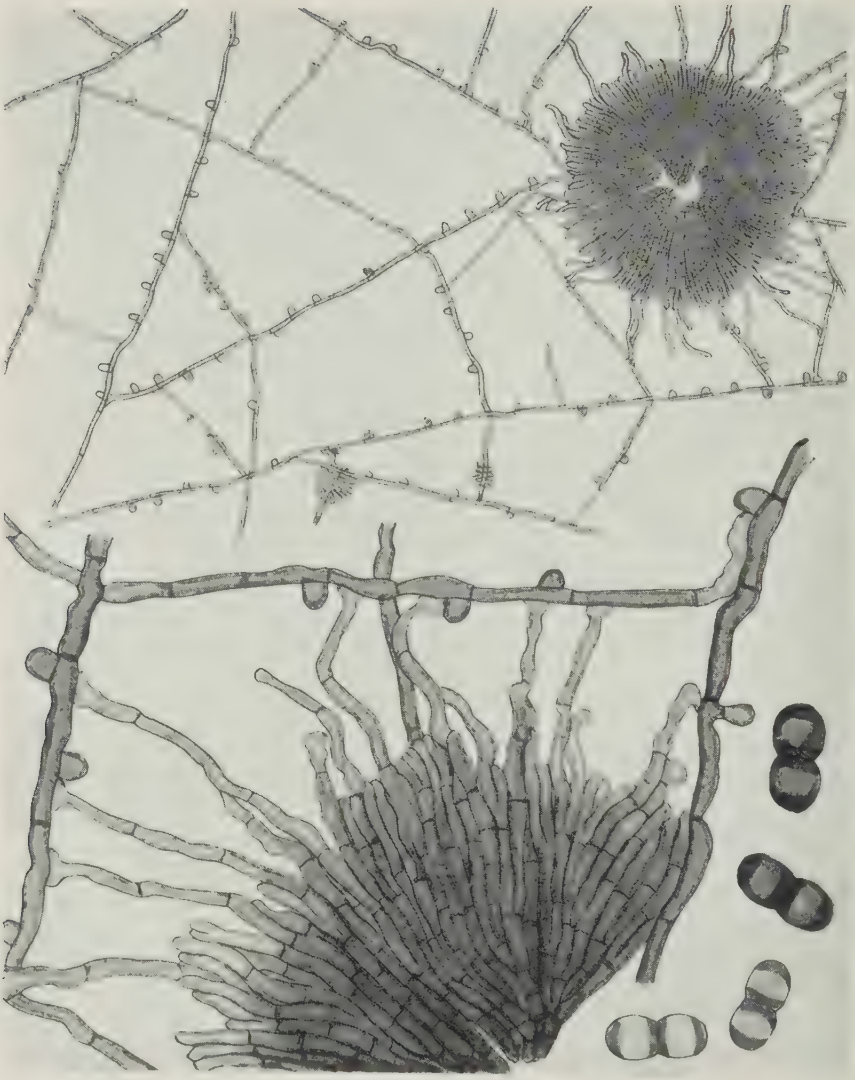

PLATE XXII.
*Asterina Bosmanae.*

PLATE XXIII.
*Asterina delicata.*

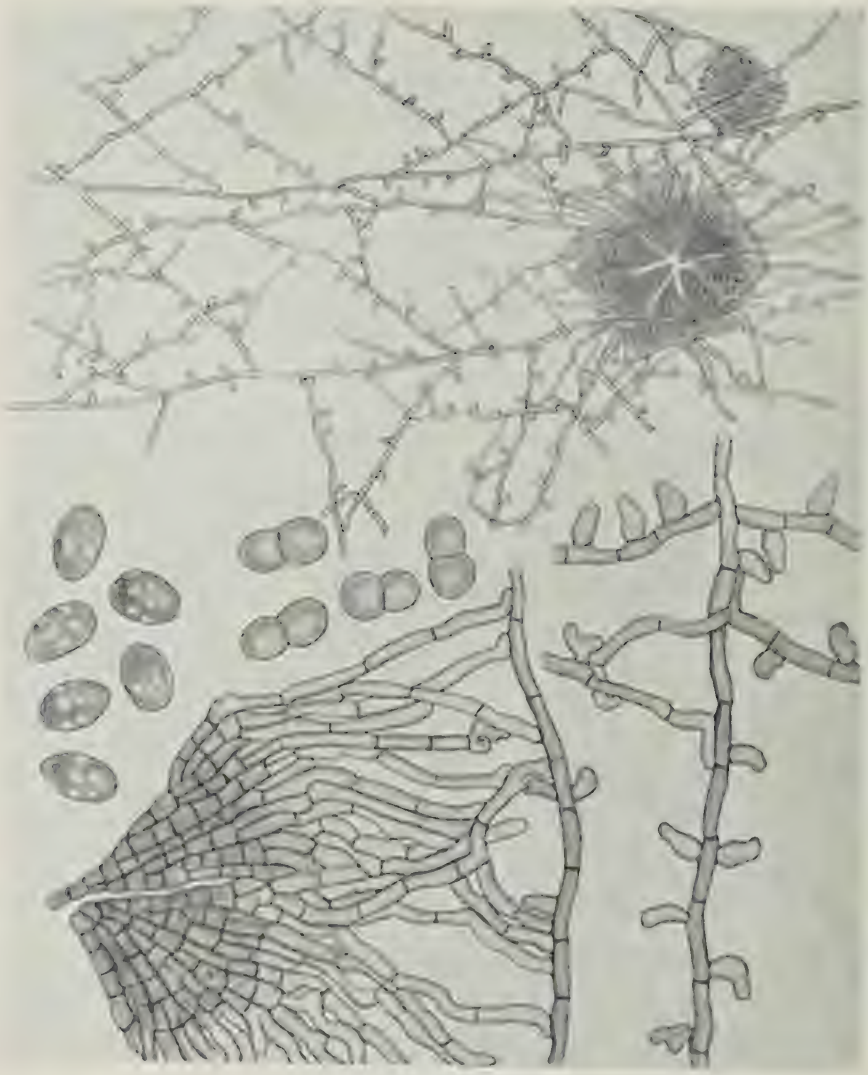

PLATE XXIV.
*Asterina Grewiae.*

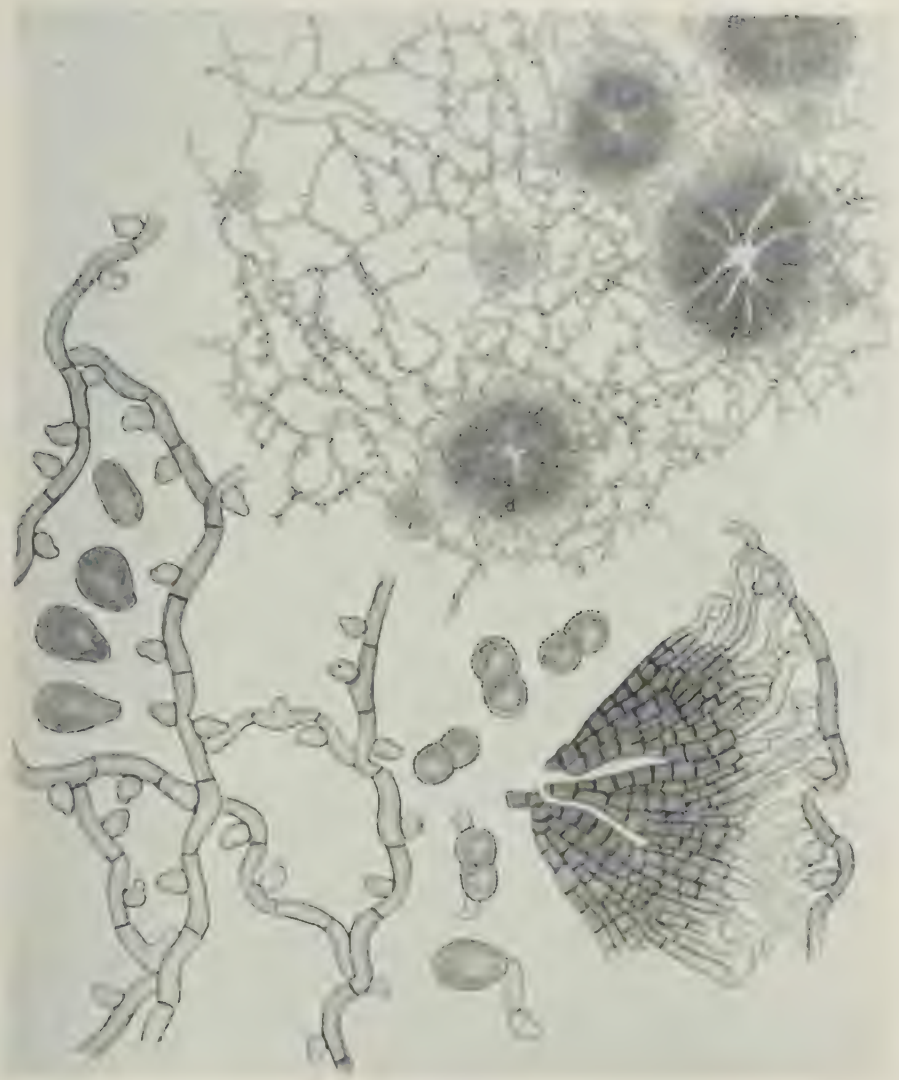

PLATE XXV
*Asterina crotoniensis.*

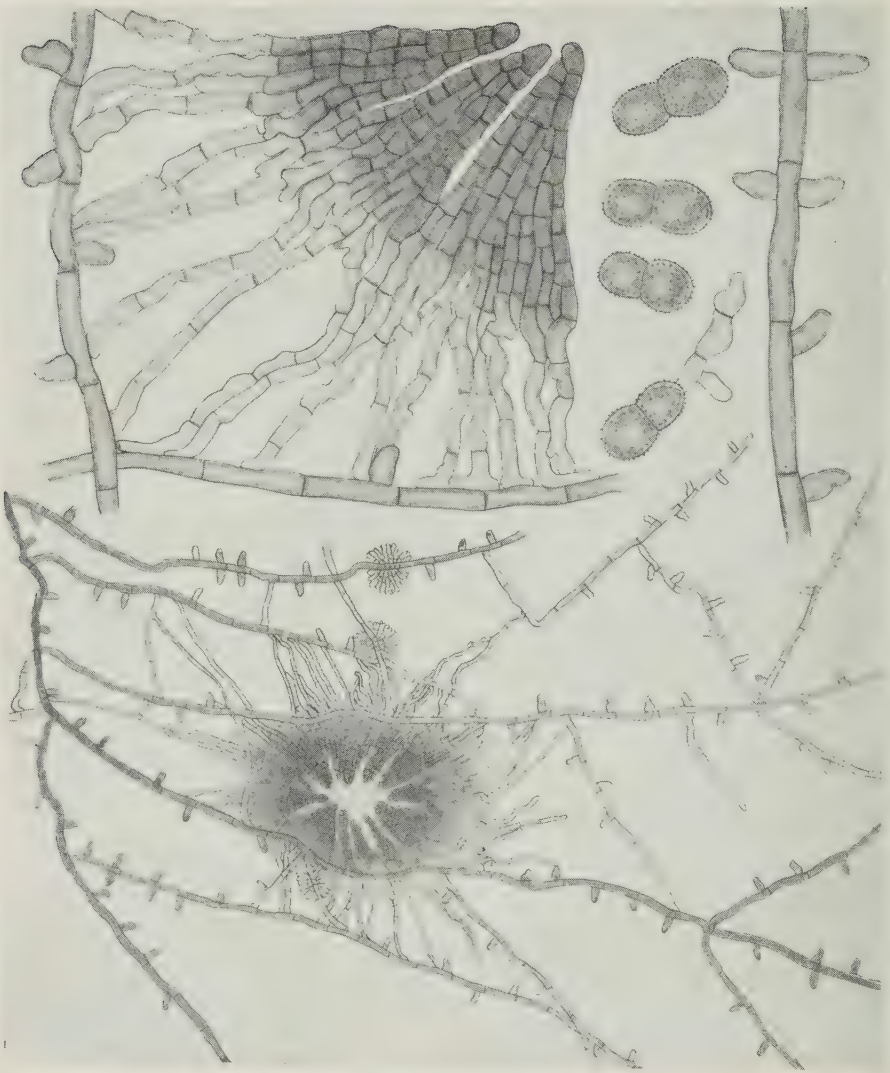

PLATE XXVI.
*Asterina Trichilae.*

PLATE XXVII
*Asterina Trichocladi.*

PLATE XXVIII.
*Asterina varipoda.*

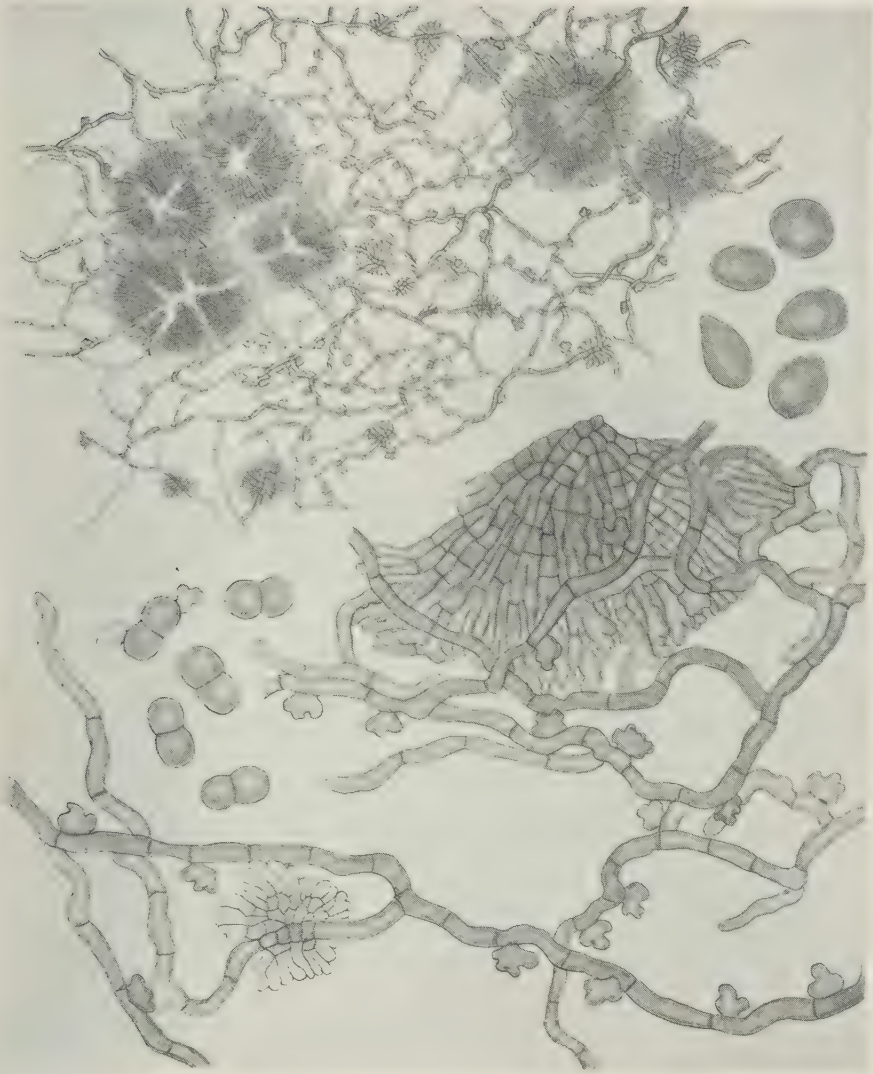

PLATE XXIX.
*Asterina Pavoniae.*

PLATE XXX.
*Asterina xumenensis.*

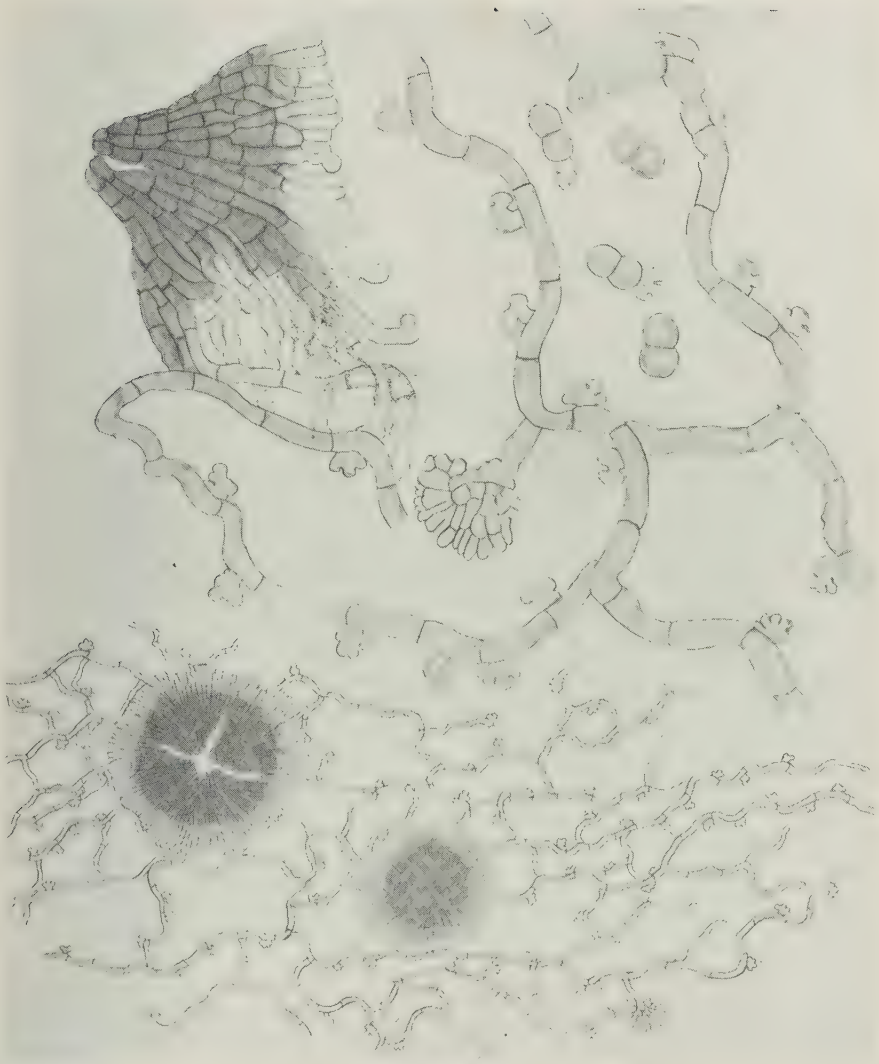

PLATE XXXI.
*Asterina undulate.*

PLATE XXXII.
*Asterina Streptocarpi.*

PLATE XXXIII
*Asterina gerbericola.*

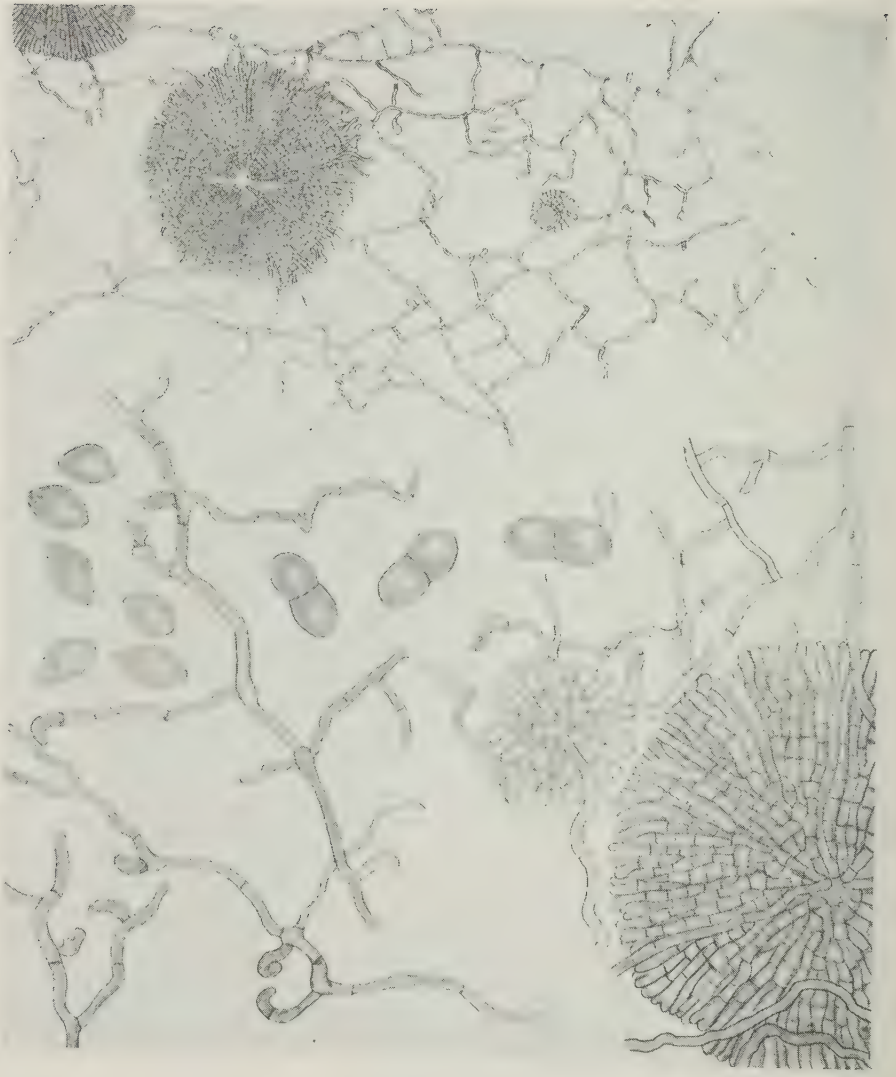

PLATE XXXIV.
*Asterina Woodiana.*

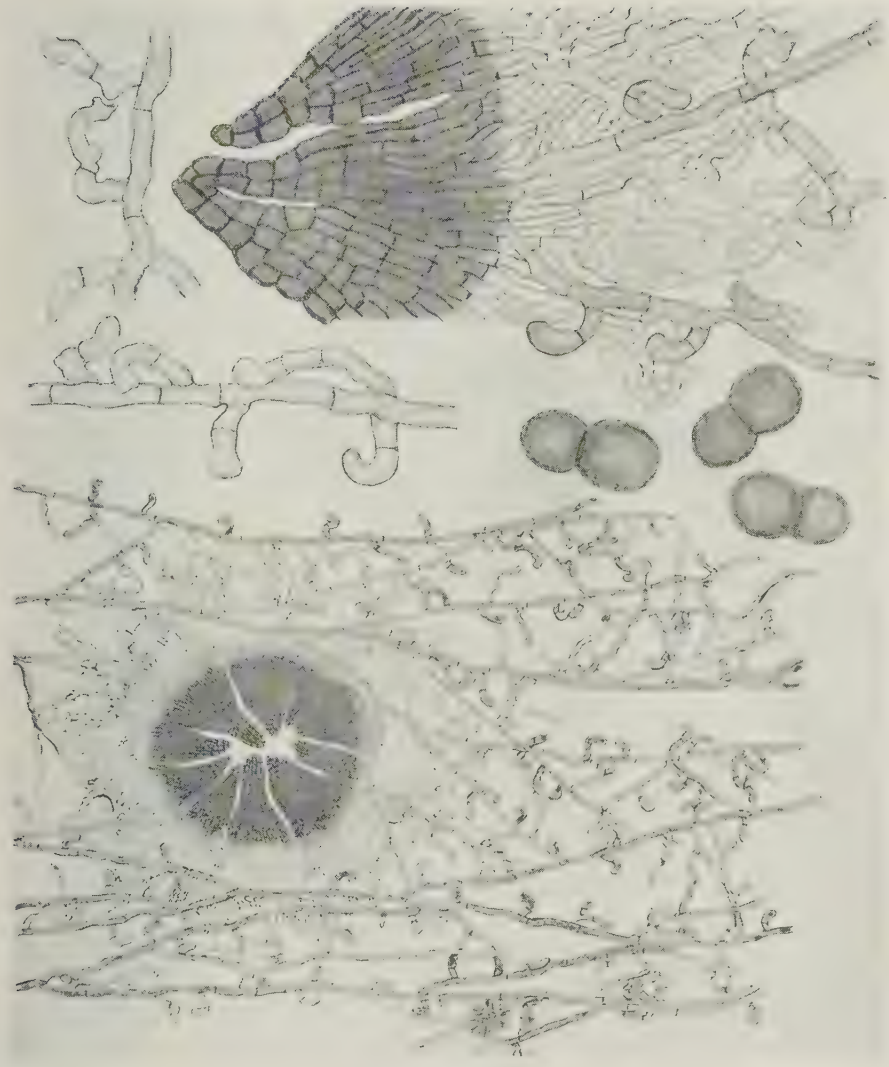

PLATE XXXV.
*Asterina uncinata.*

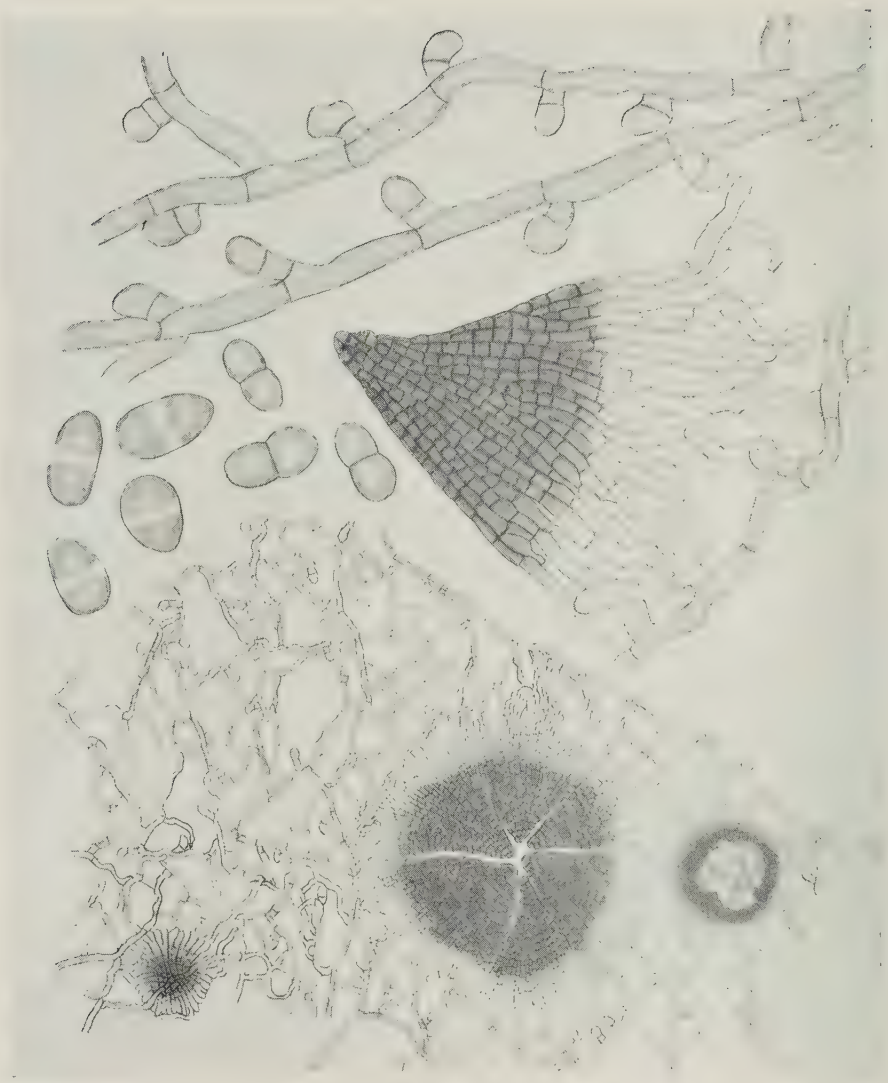

PLATE XXXVI.
*Asterina reticulata.*

PLATE XXXVII.
*Asterina Scolopiae.*

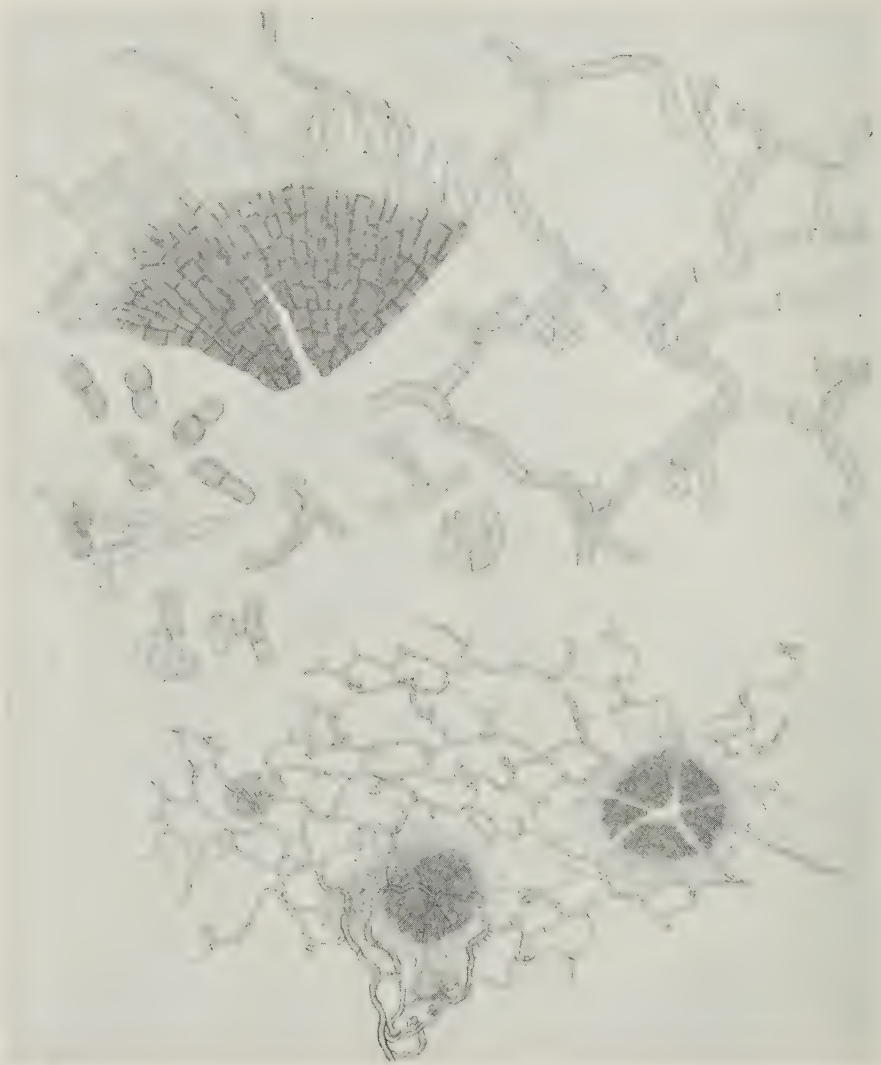

PLATE XXXVIII.
*Asterina Saniculae.*

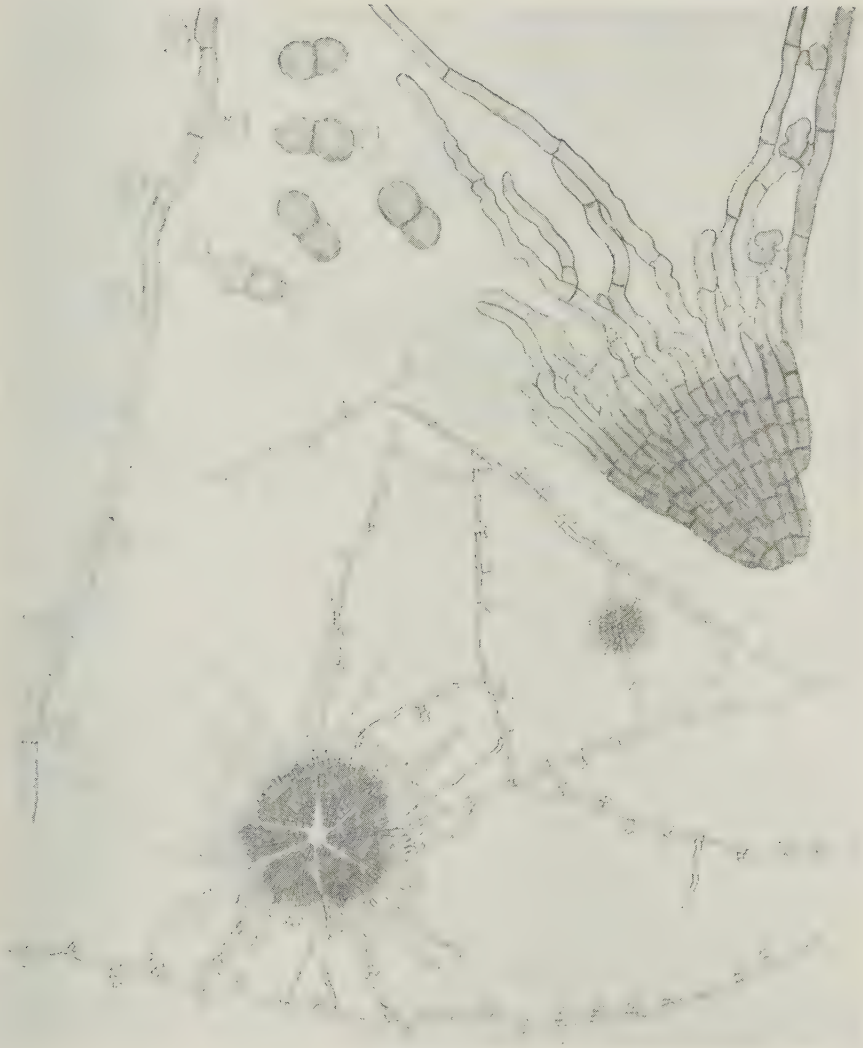

PLATE XXXIX.
*Asterina fimbriata.*

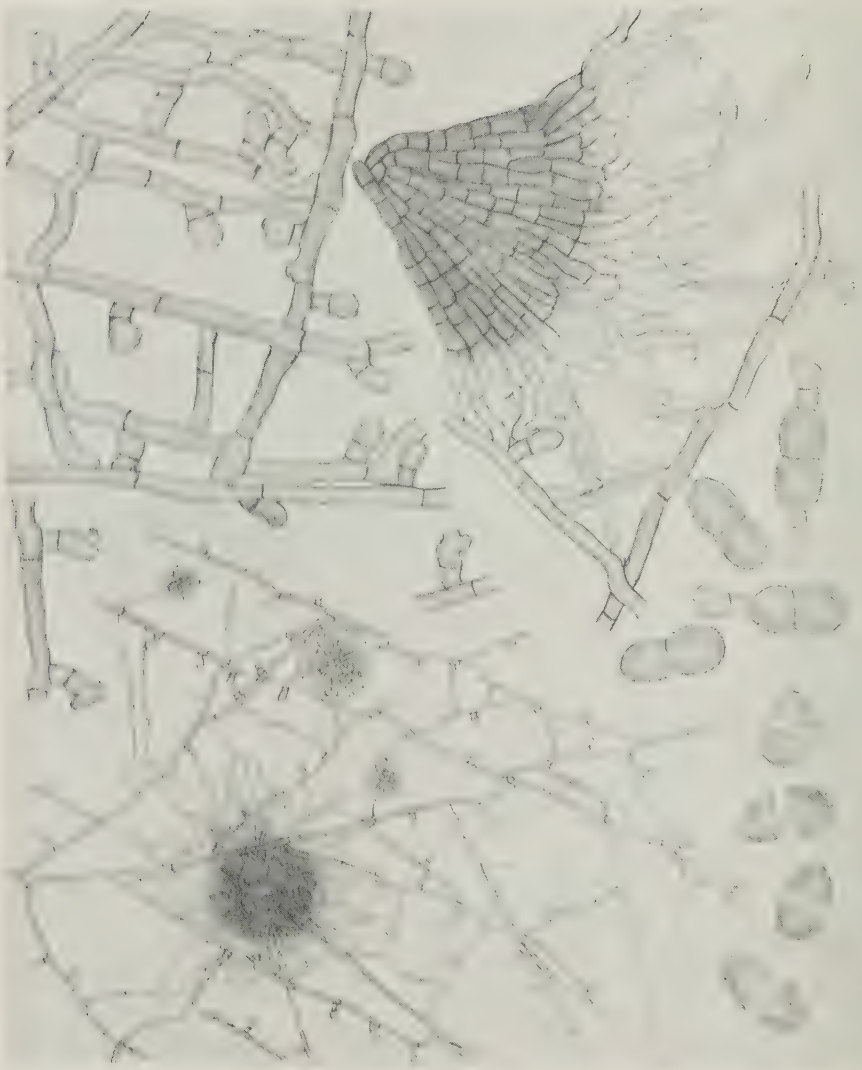

PLATE XL.
*Asterina Combreti.*

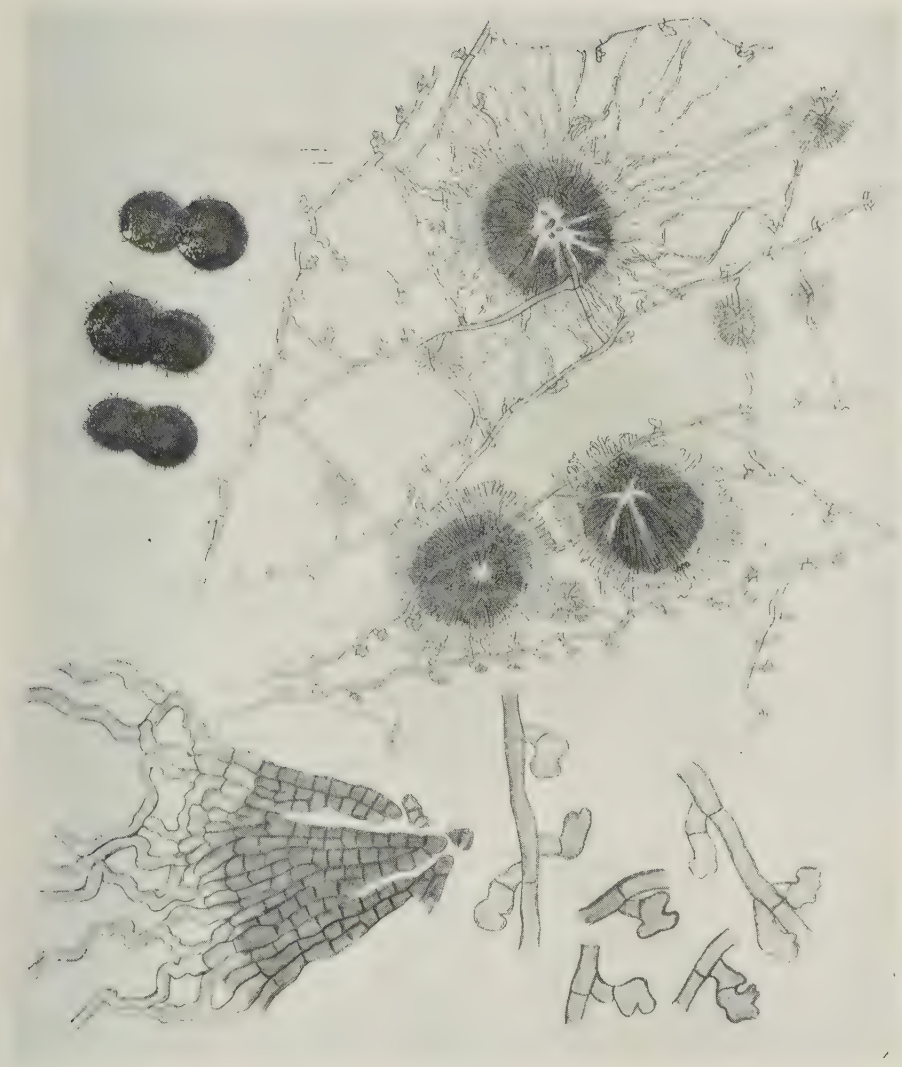

PLATE XLI.
*Asterina Peglerae.*

PLATE XLII.
*Asterina loranthicola.*

PLATE XLIII.
*Asterina polythyria.*

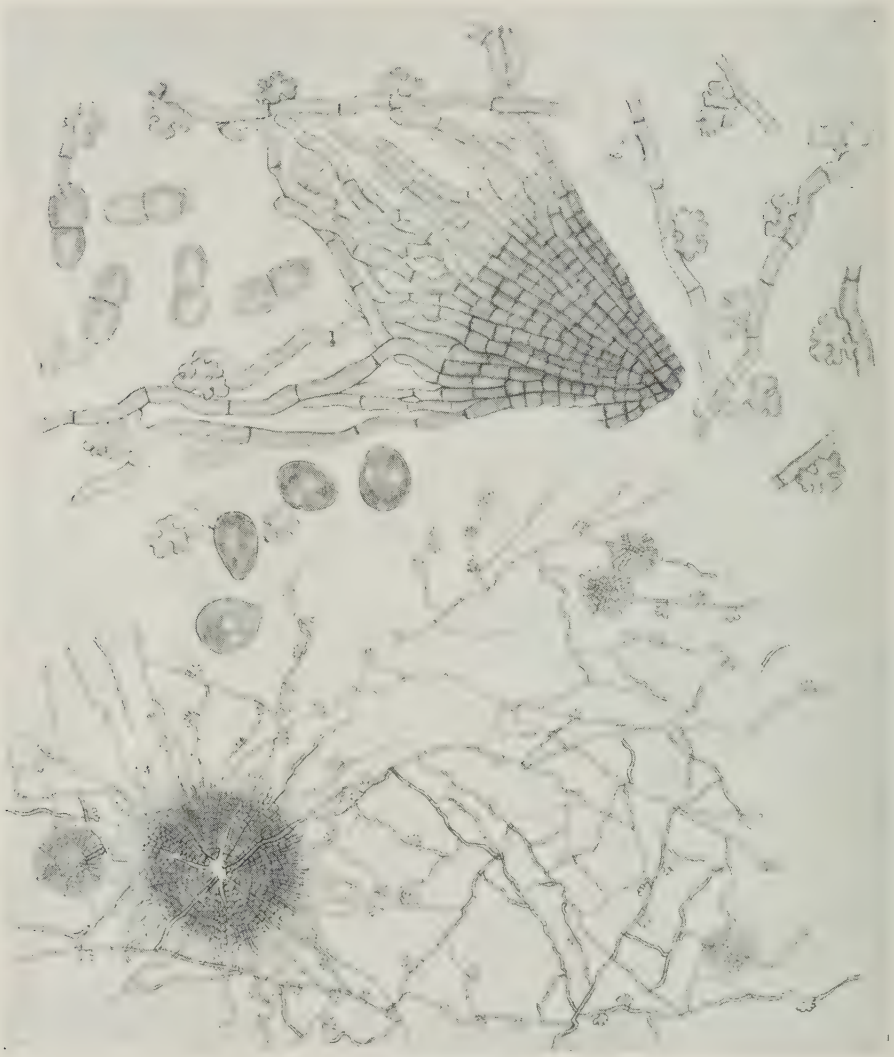

PLATE XLIV.
*Asterina clausenicola.*

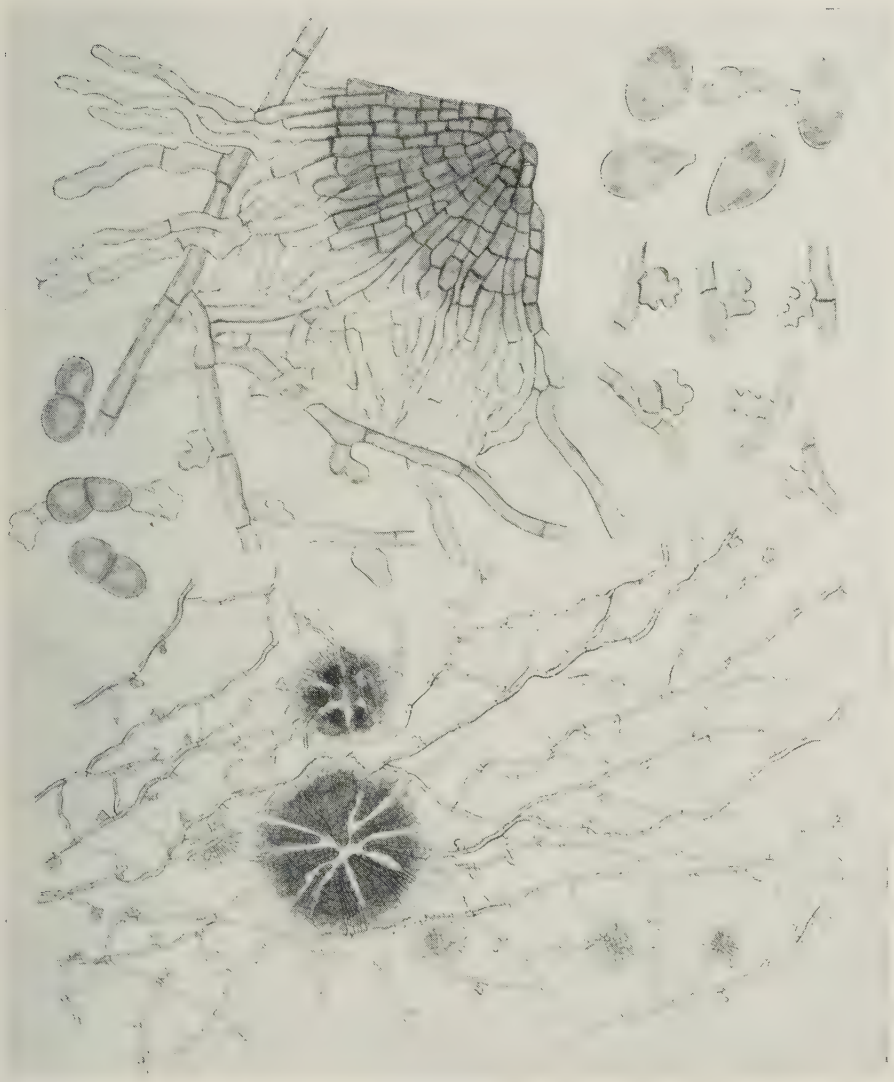

PLATE XLV.
*Asterina erysiphoides.*

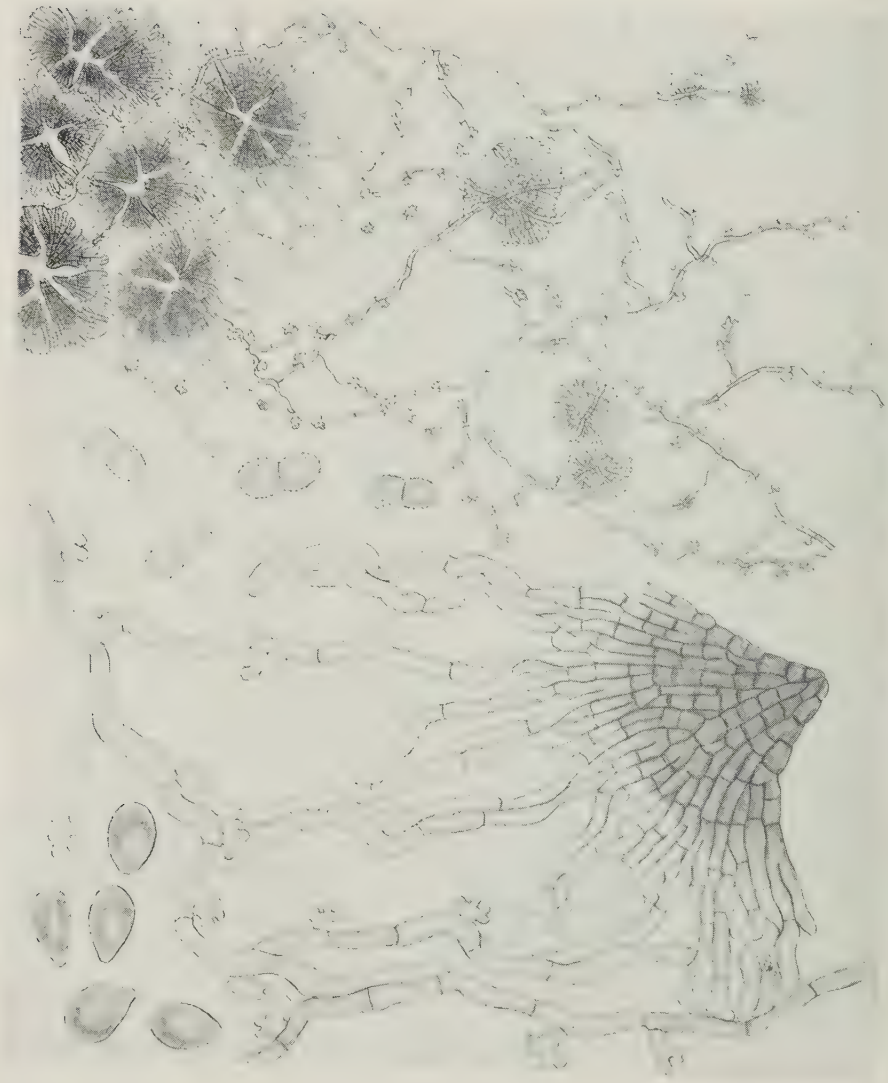

PLATE XLVI.
*Asterina tertia var. africana.*

PLATE XLVII.
*Asterina diplocarpa.*

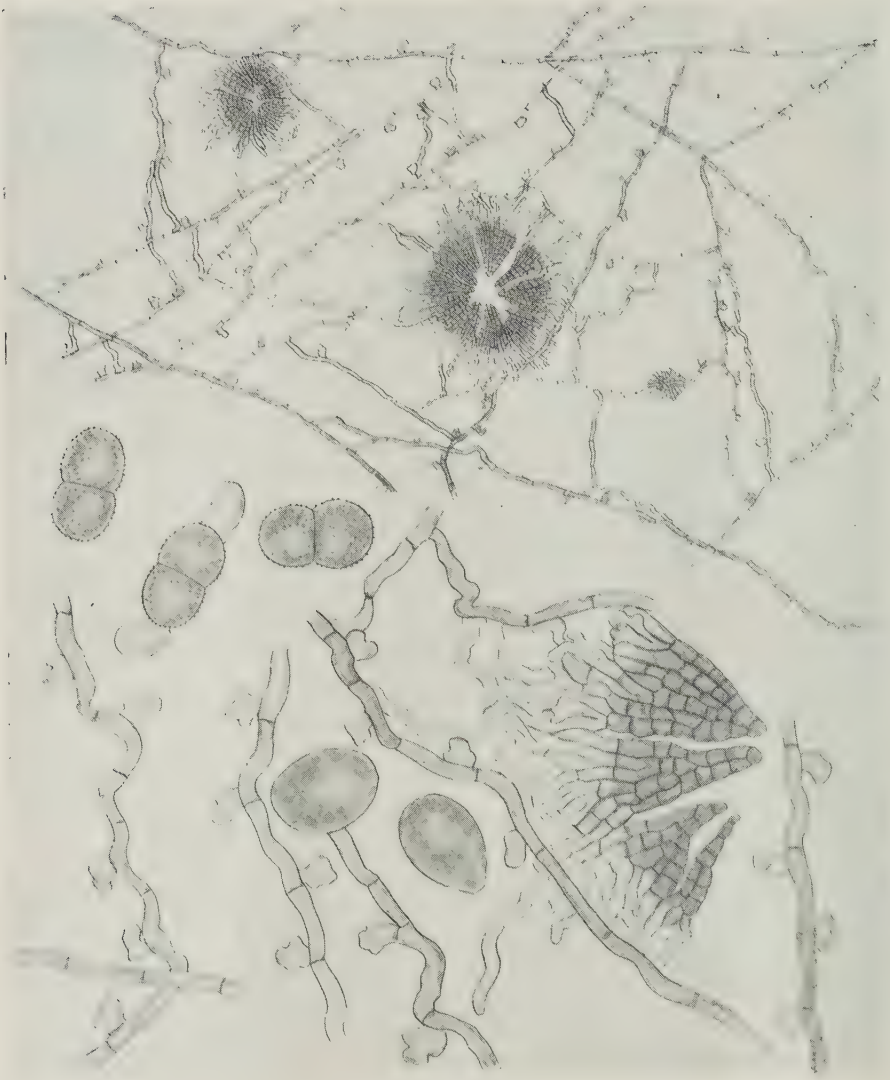

PLATE XLVIII.
*Asterina Excoecariae.*

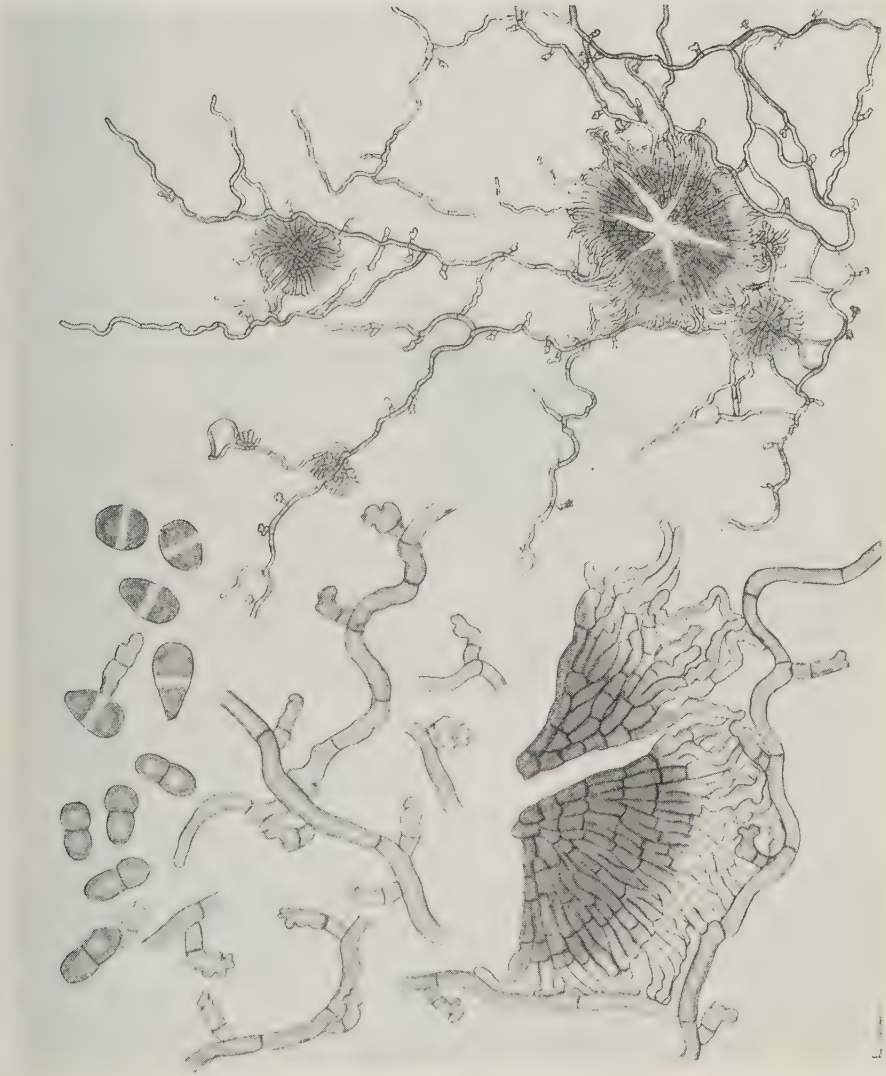

PLATE XLIX.
*Asterina Fleuryae.*

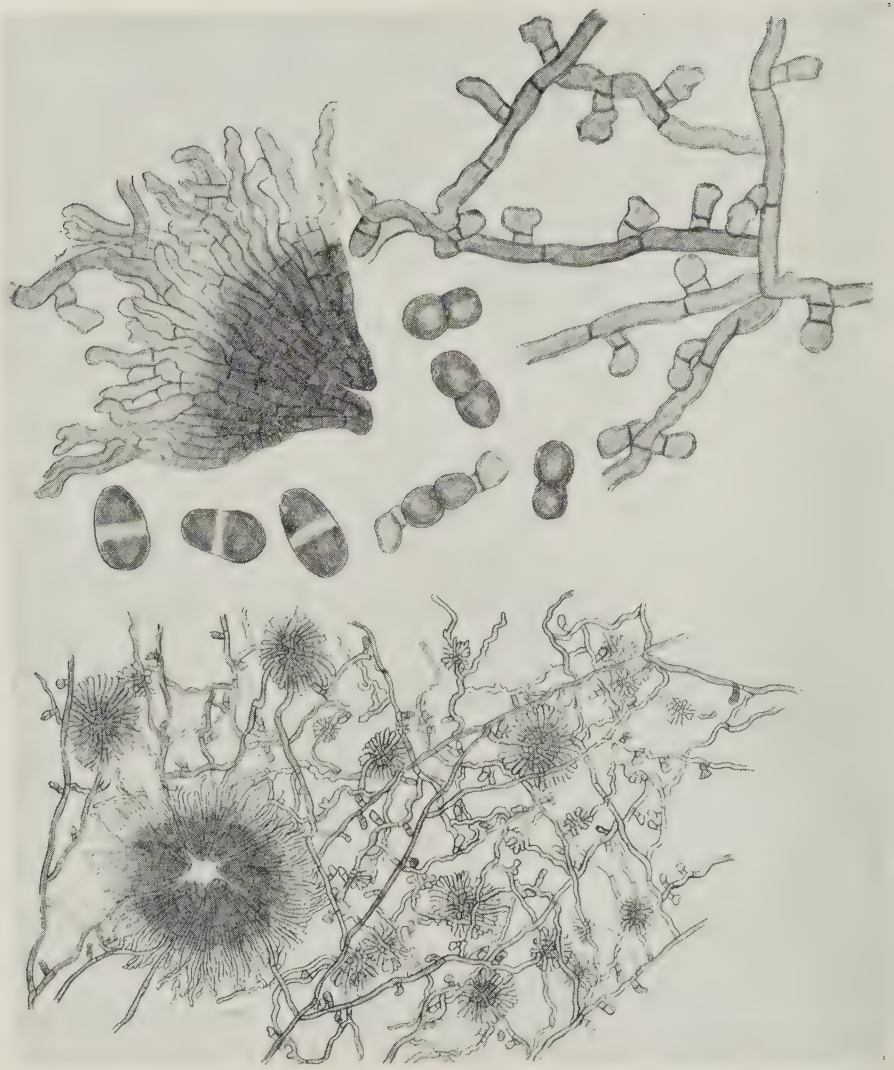

PLATE L.
*Asterina van der Bylii.*

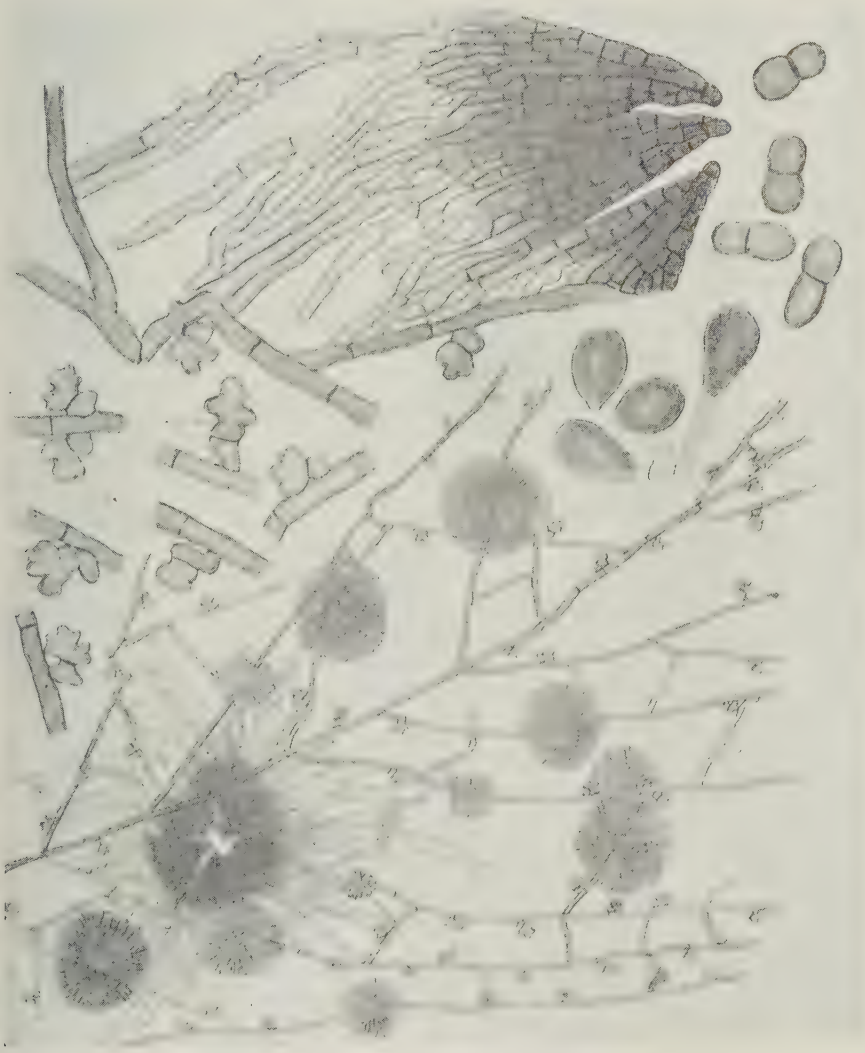

PLATE LI.
*Asterina peraffinis.*

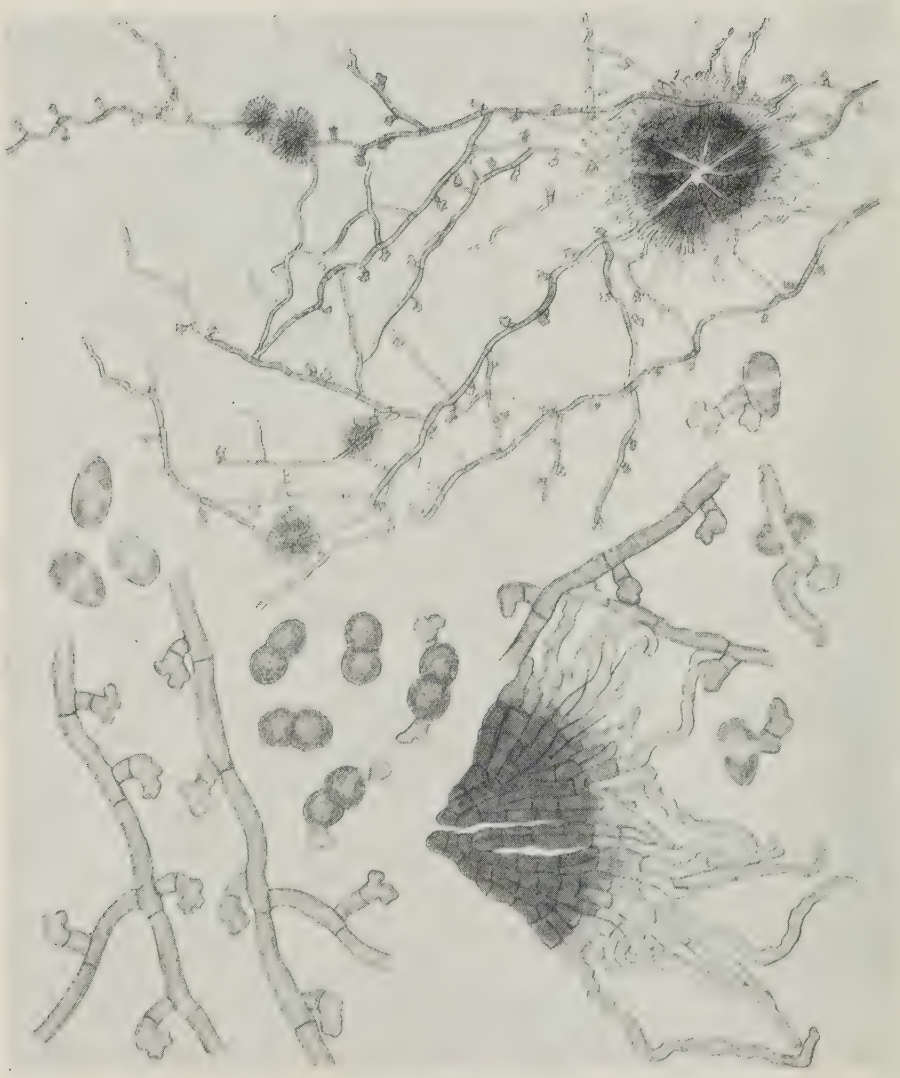

PLATE LII.
*Asterina radio-fissilis.*

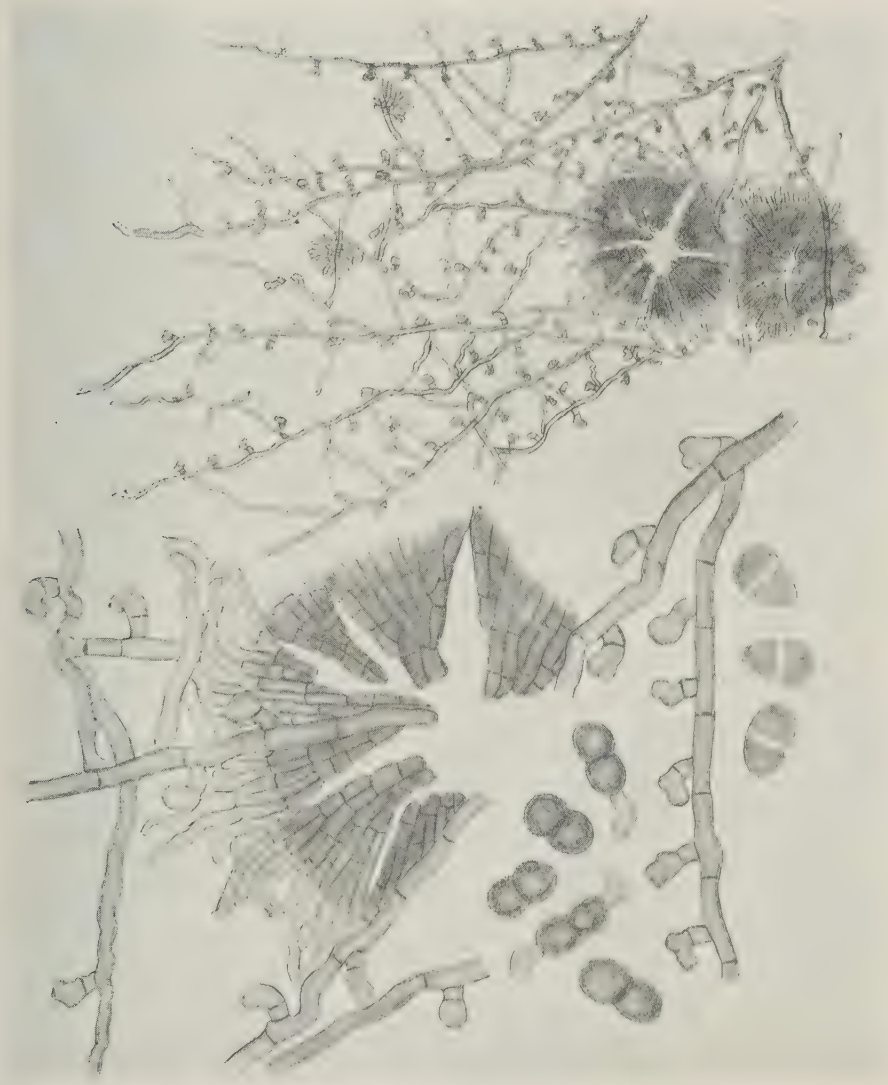

PLATE LIII.
*Asterina africana.*

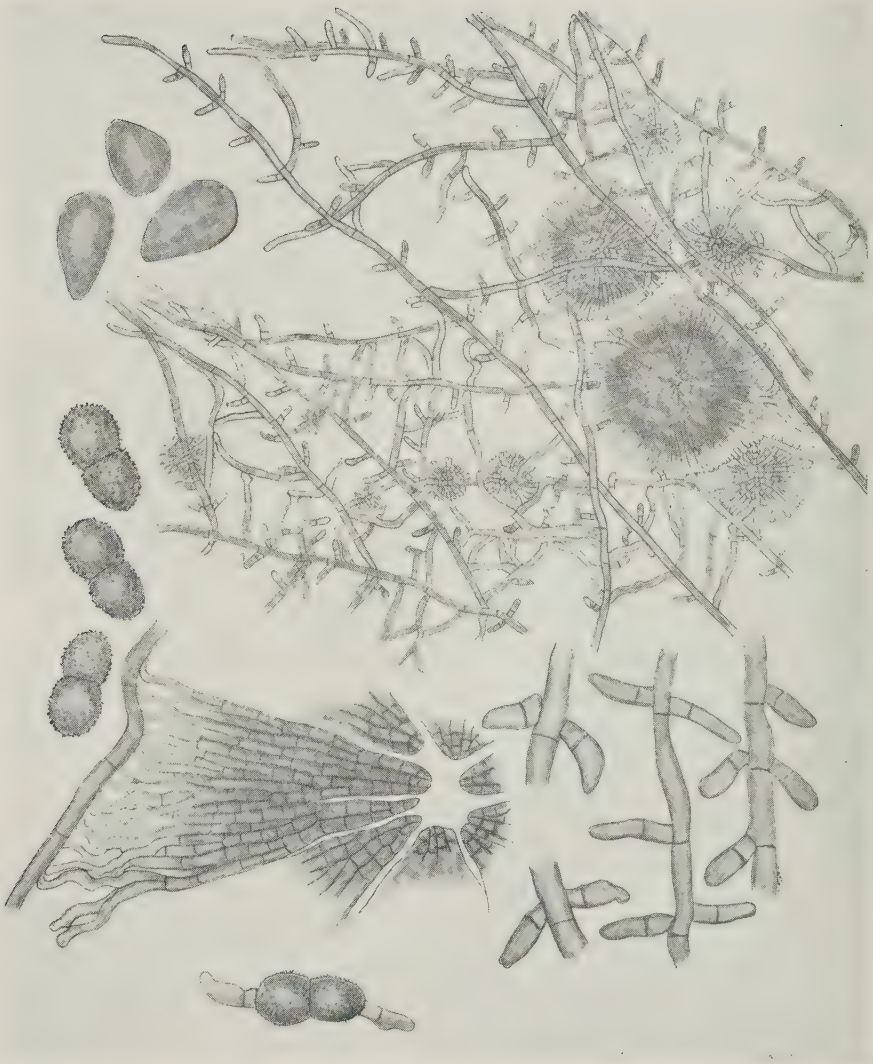

PLATE LIV.
*Asterina elegans.*

PLATE LV.
*Asterina capparidicola.*

PLATE LVI
*Asterina Woodii.*

PLATE LVII.
*Asterina Rinoreae.*

PLATE LVIII.
*Clypeolella psychotriae.*

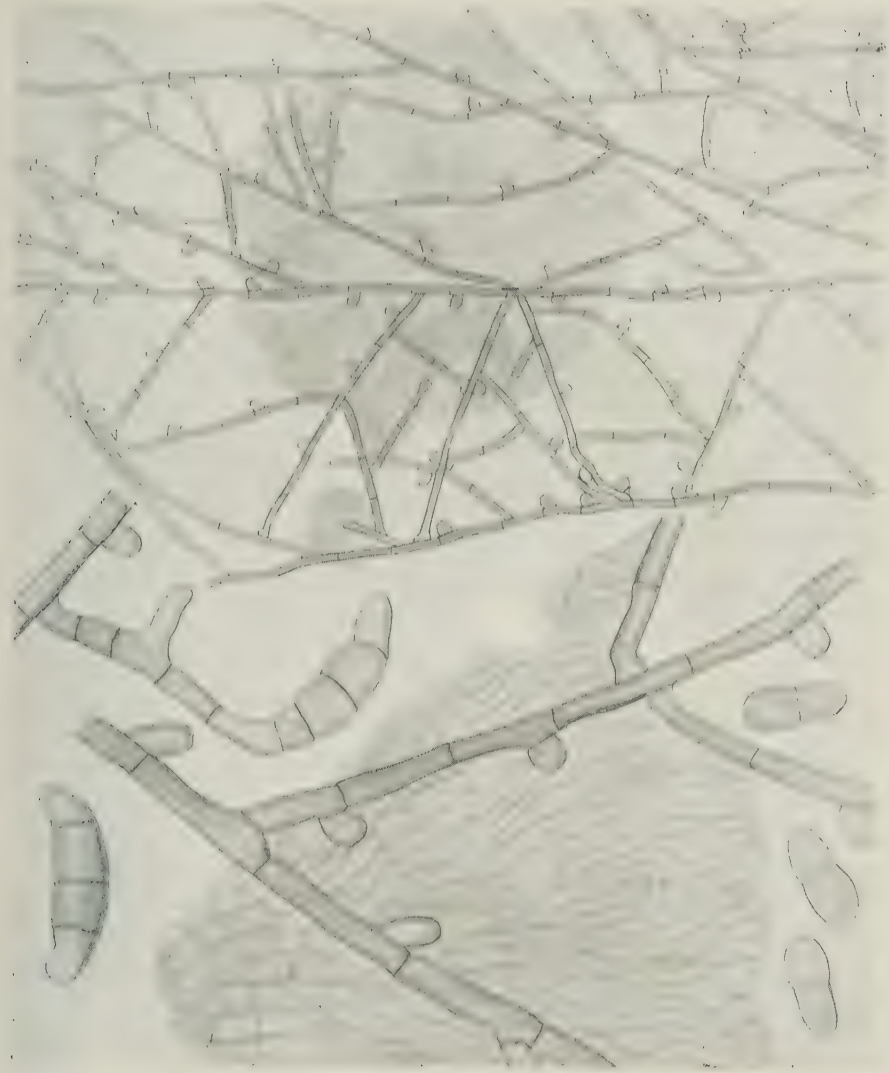

PLATE LIX.
*Clypeolella rhamnicola.*

PLATE LX.
*Asterolibertia megathyria.*

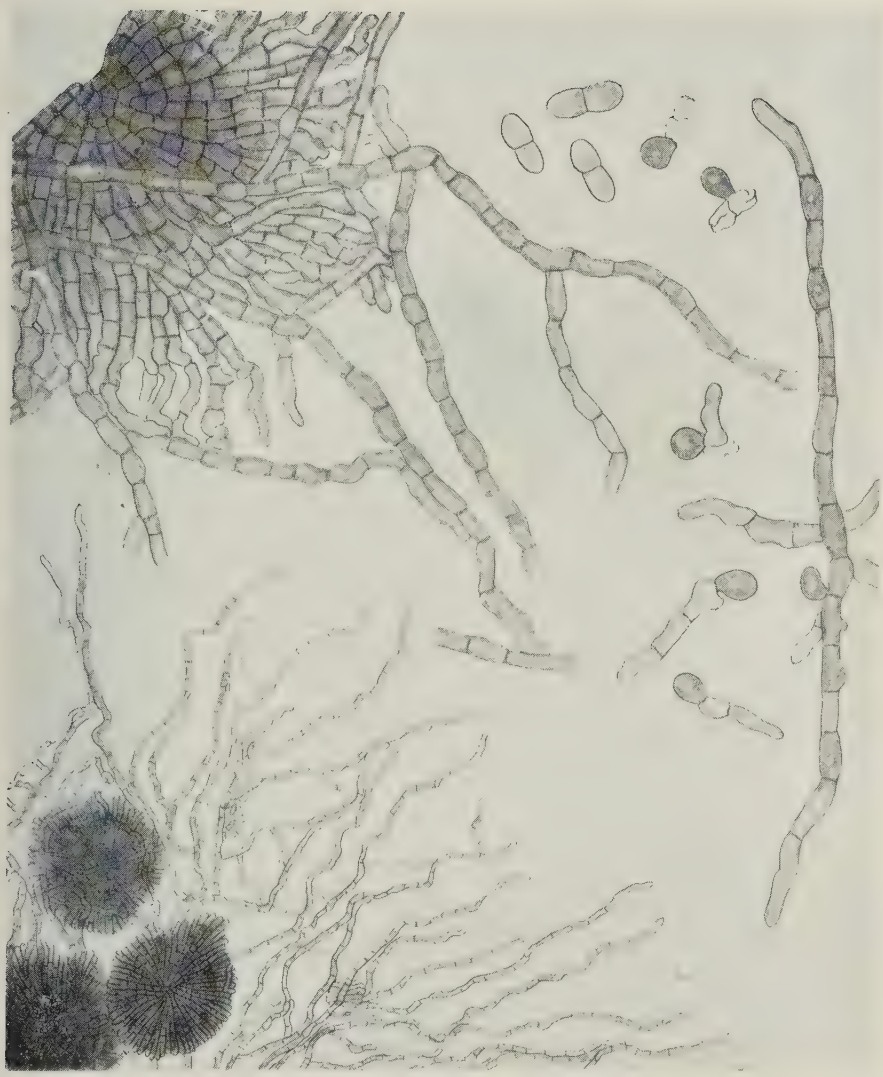

PLATE LXI.
*Asterolibertia Burchelliae.*

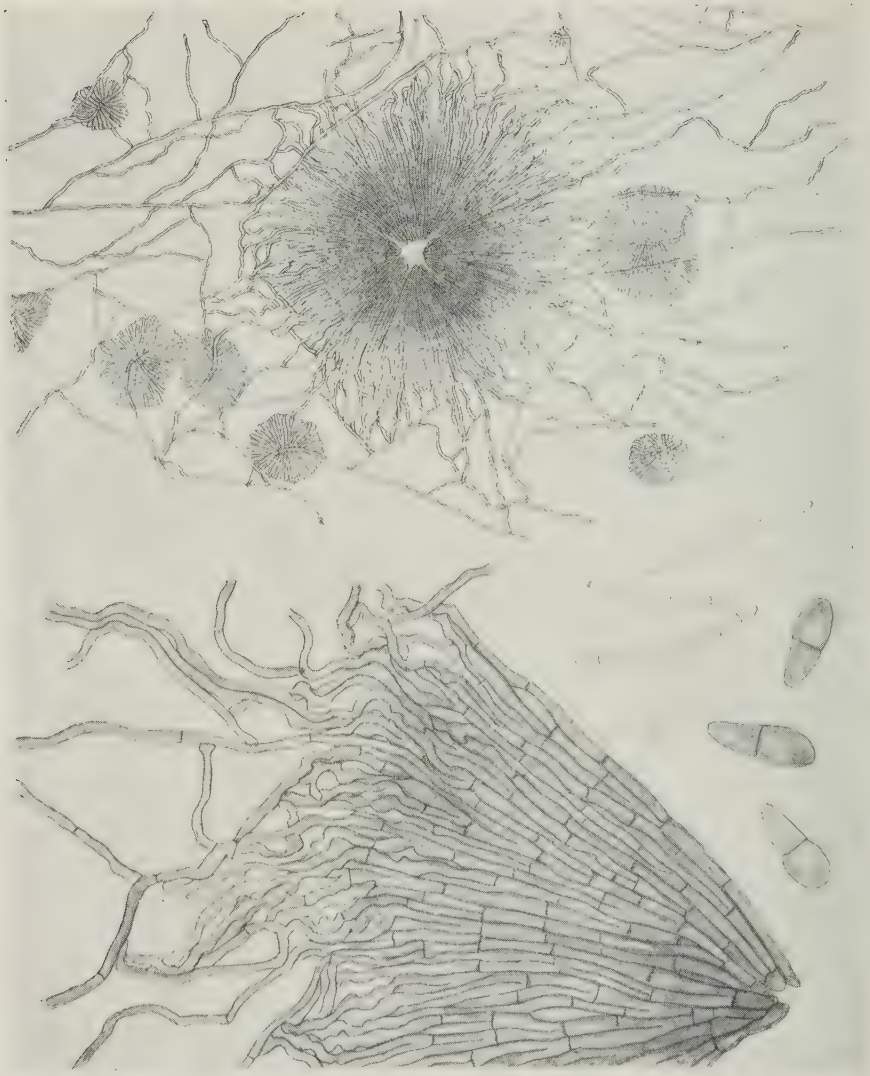

PLATE LXII.
*Asterinella Tecleae.*

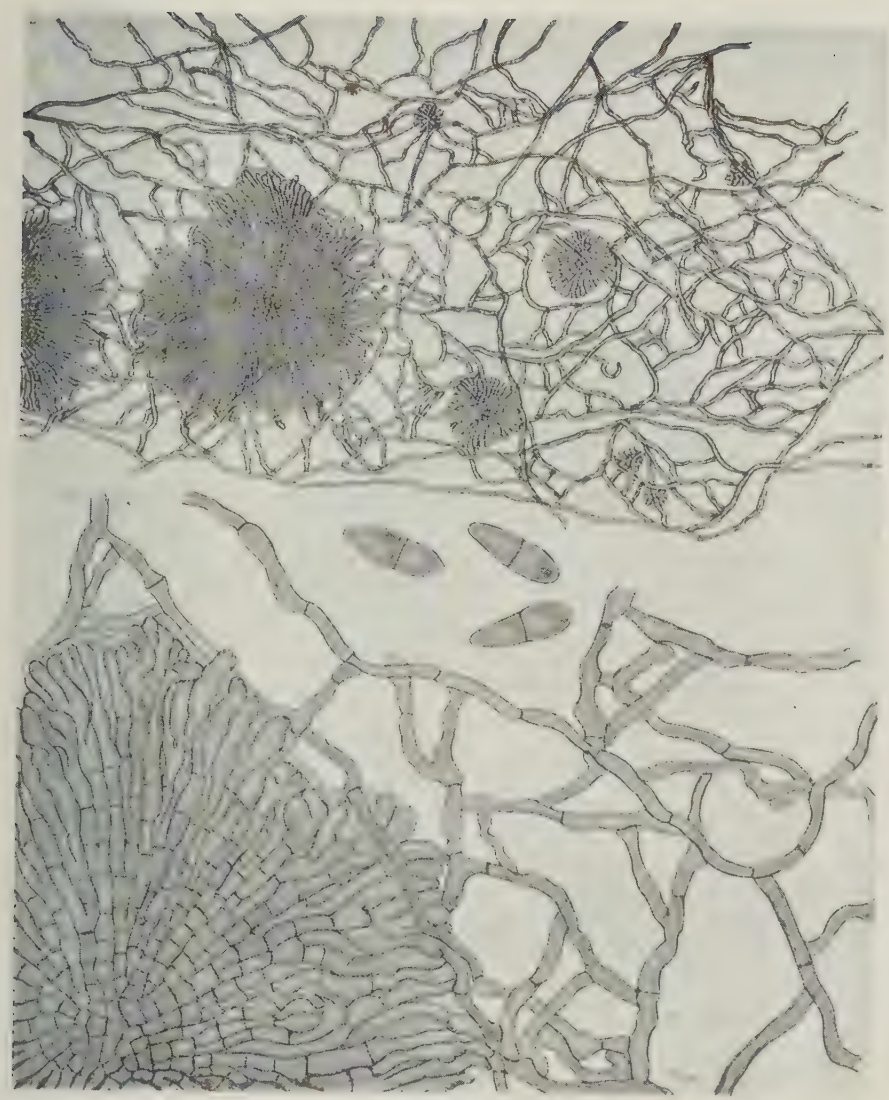

PLATE LXIII.
*Asterinella Pterocelastri.*

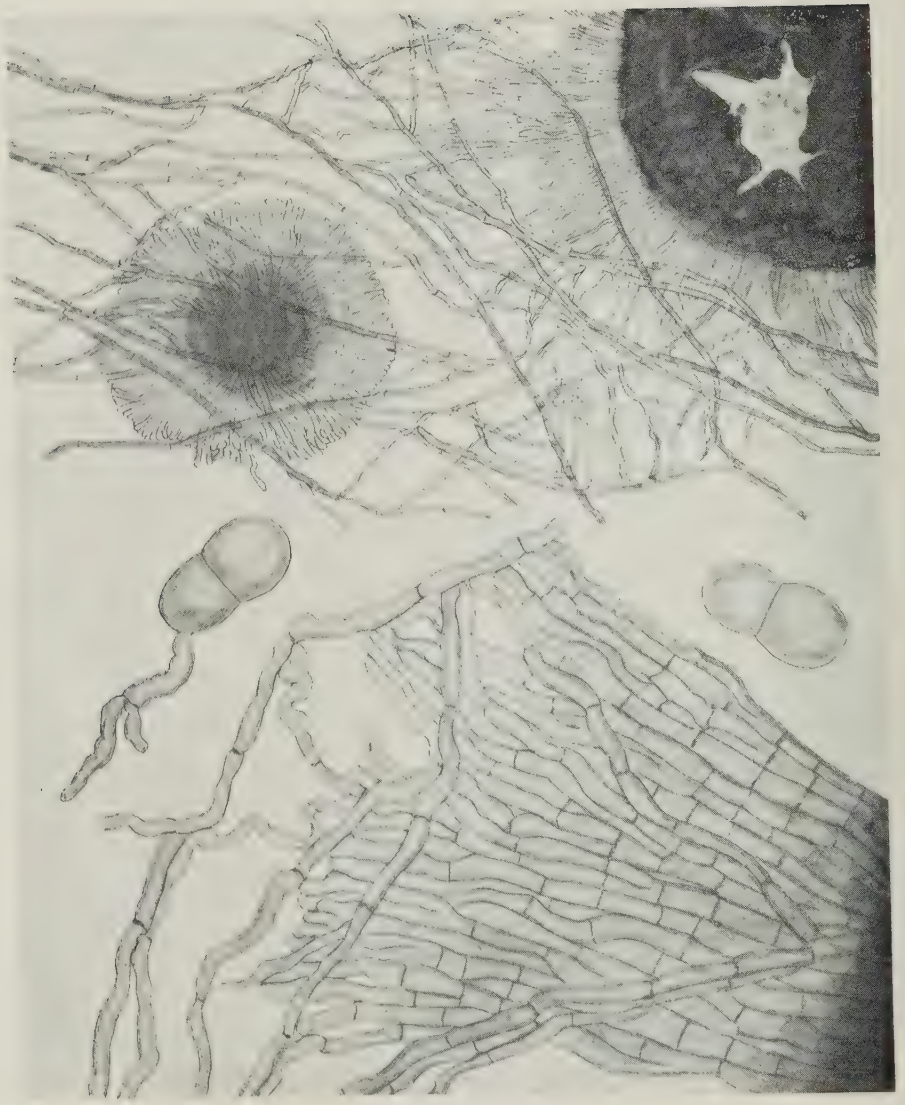

PLATE LXIV.
*Asterinella Mimusopsidis.*

PLATE LXV.
*Lembosiopsis eucalyptina.*

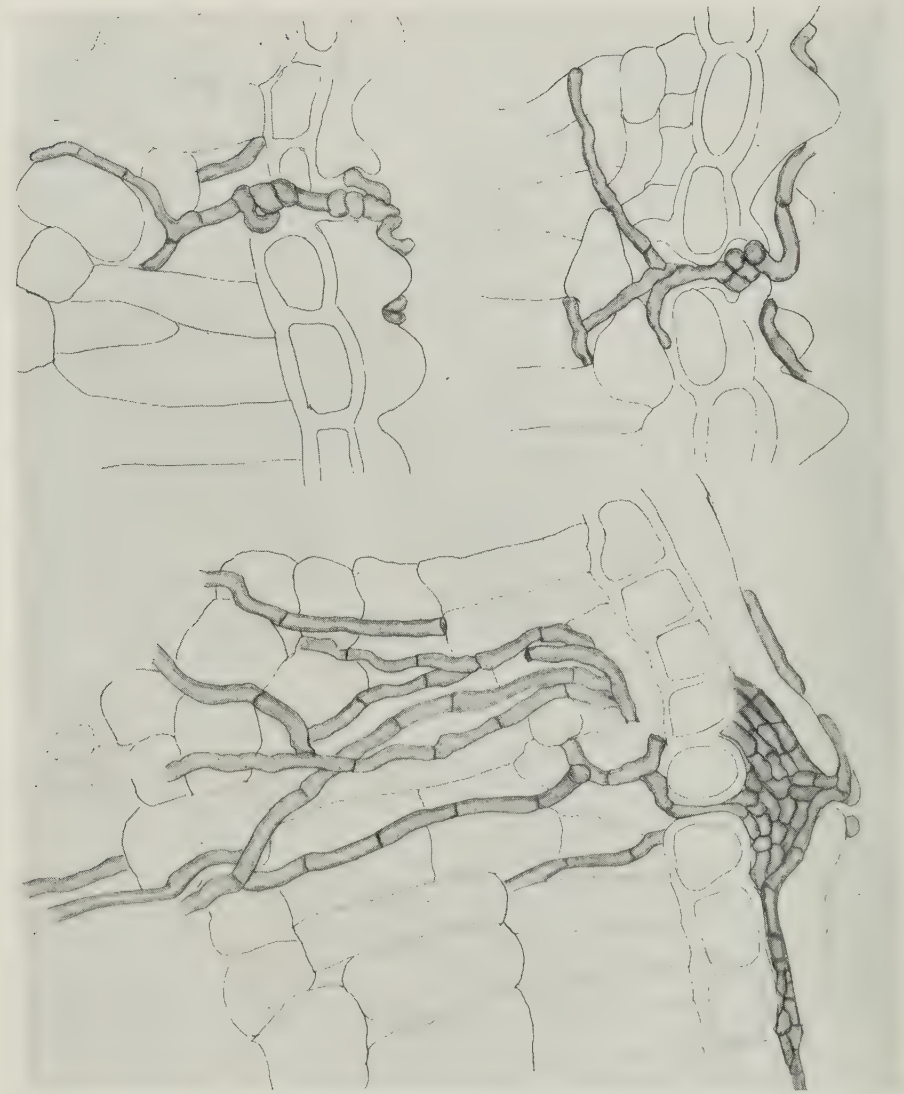

PLATE LXVI.
Sections through leaves of
above (*a*) (*b*) *Eucalyptus gigantea*,
Below (*c*) *Eucalyptus globulus*,
showing internal mycelium of *Lembosiopsis eucalyptina*.

PLATE LXVII.
*Lembosia Phillipsii.*

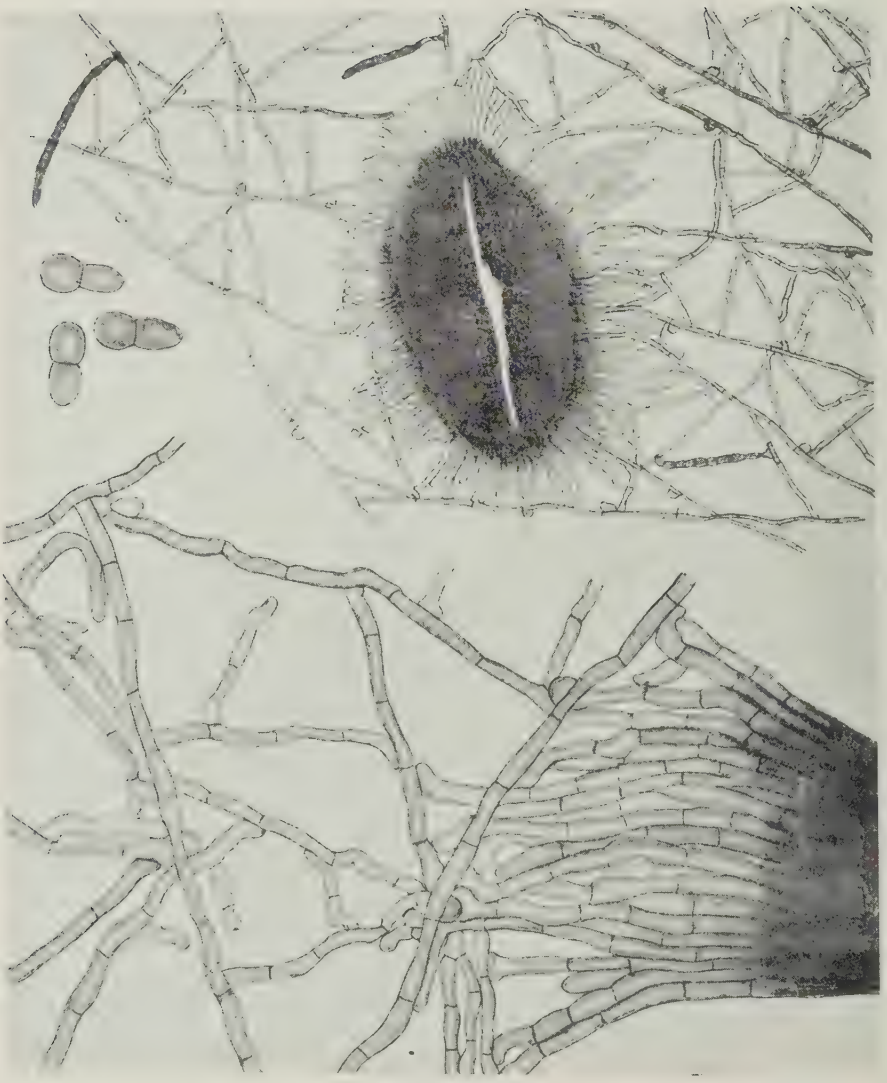

PLATE LXVIII.
*Lembosia piriensis.*

PLATE LXIX.
*Lembosia Wageri.*

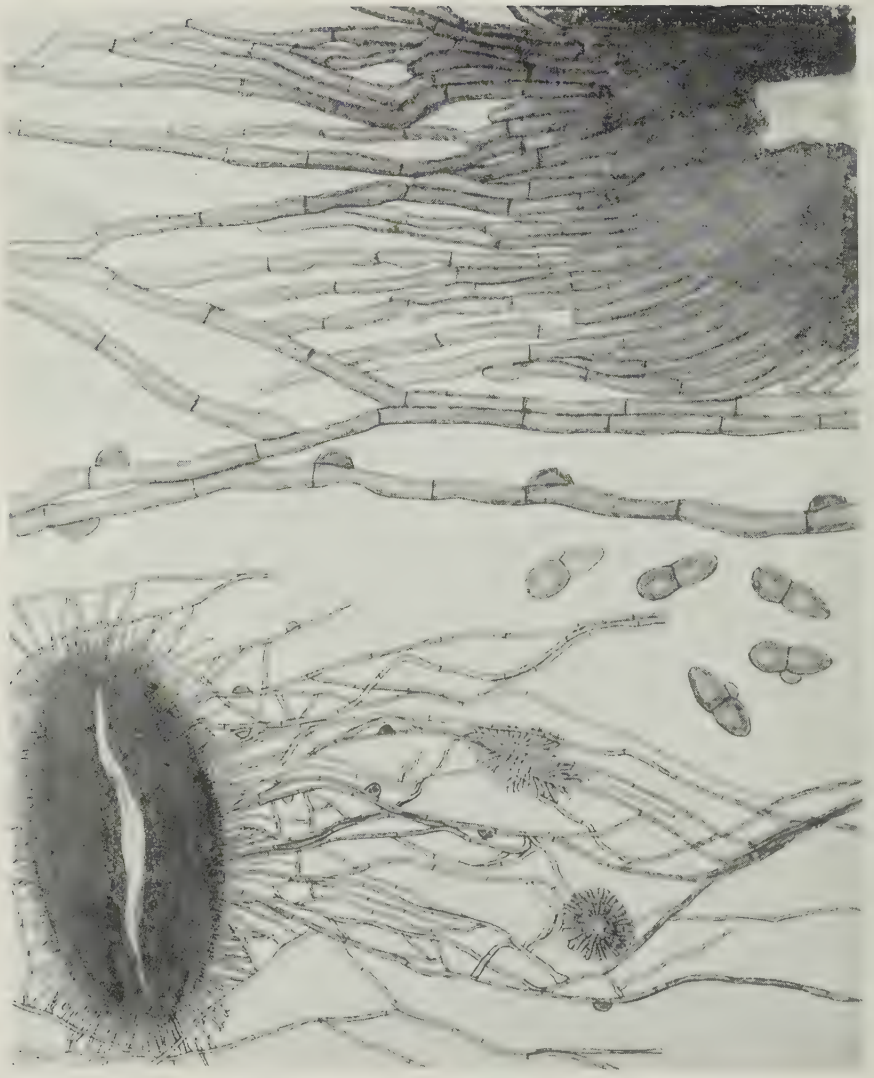

PLATE LXX.
*Lembosia durbana.*

PLATE LXXI.
*Echidnodes lembosioides.*

PLATE LXXII.
*Echidnodes Acokantherae.*

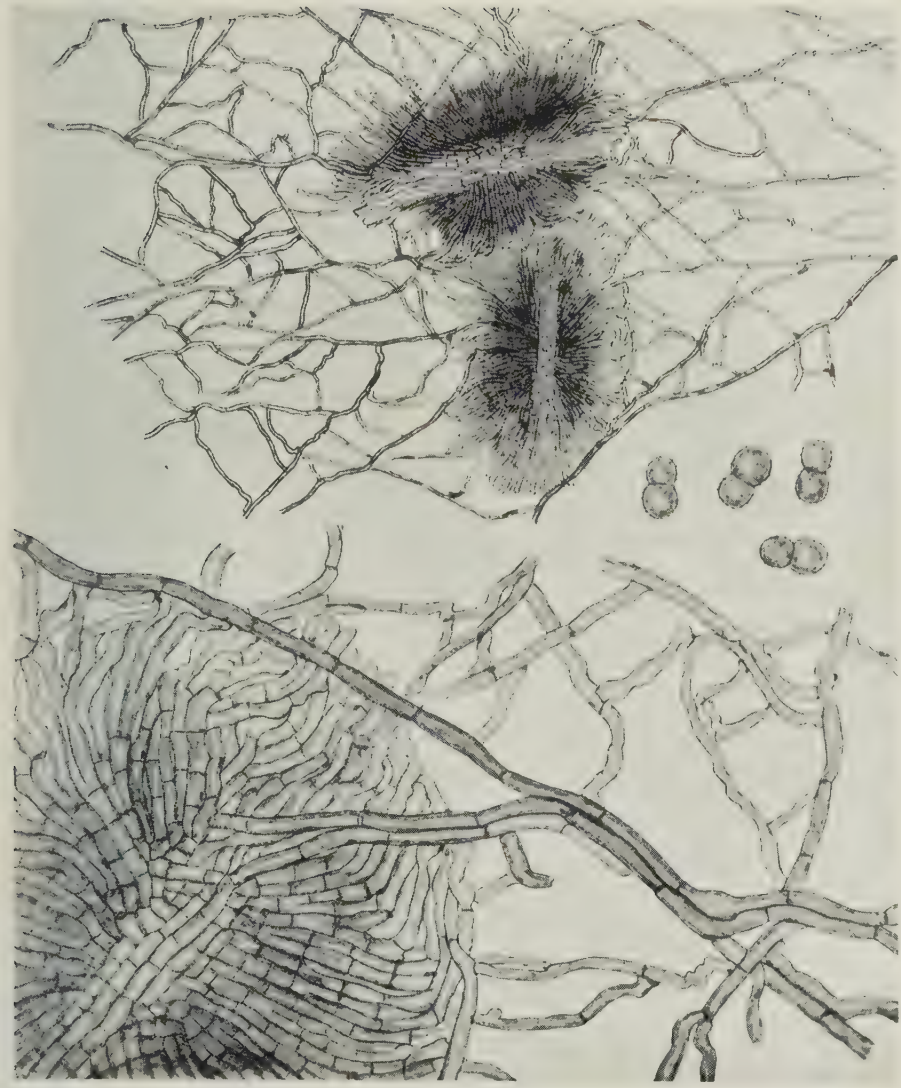

PLATE LXXIII.
*Echidnodes rhoina.*

PLATE *LXXIV.*
*Echidnodes natalensis.*

PLATE *LXXV*.
*Echidnodes africana*.

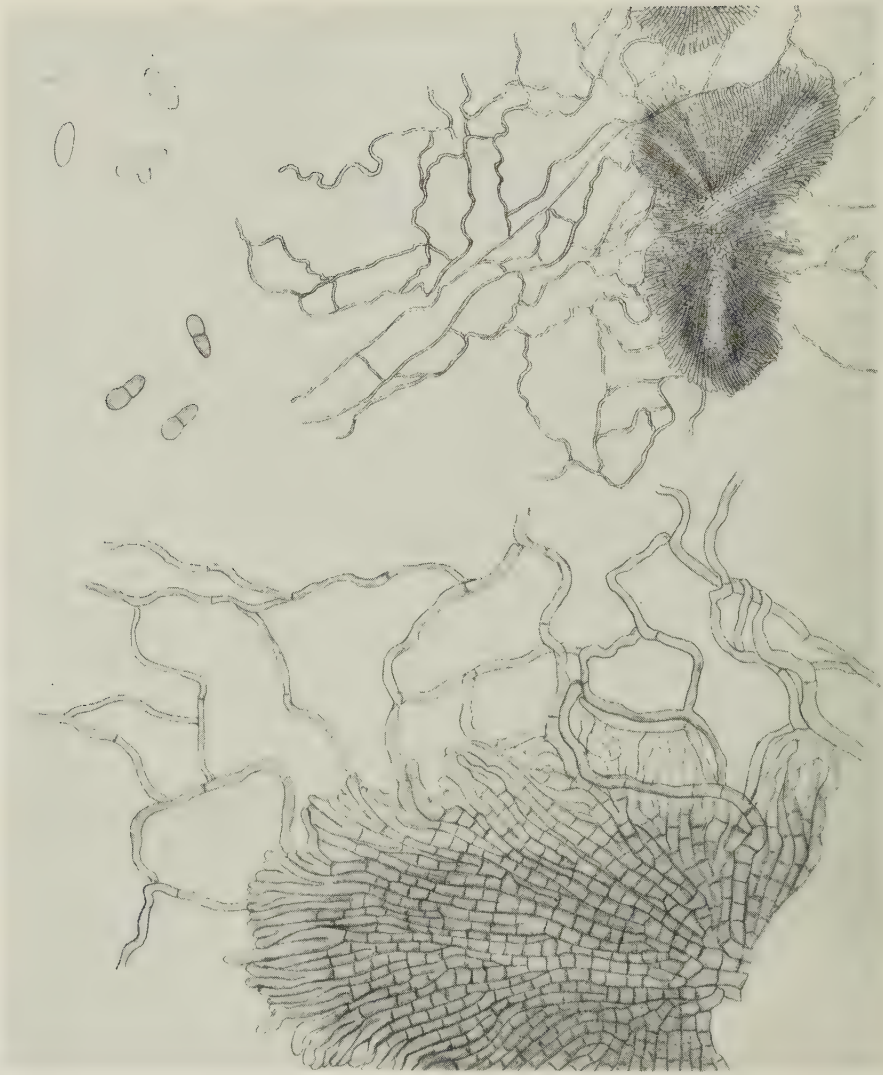

PLATE *LXXVI.*
*Echidnodes Hypolepidis.*

# REVISED DESCRIPTIONS OF SOUTH AFRICAN SPECIES OF PHYLLACHORA AND RELATED GENERA.

By Ethel M. Doidge.

In their work on the *Dothideaceae* (7) Theissen and Sydow included in this group the families *Polystomellaceae*, *Dothideaceae* and *Montagnellaceae*. In contrast to the erumpent *Dothideaceae*, the *Phyllachoraceae* comprised forms which remain covered by the matrix and three natural sub-families were distinguished, characterised by the position of the stroma: The *Trabutiineae*, between the cuticle and the epidermis, the *Scirrhiineae* between the epidermis and the palisade cells or equivalent subepidermal layer and the *Phyllachorineae* in the mesophyll. The family was characterised as follows:—

**Phyllachoraceae** Theiss. et Syd.

Stroma under the cuticle or epidermis, remaining covered, with cuticular or epidermal clypeus, prosenchymatous-dothideoid in structure or more or less regularly hyphal. Loculi sunk in the stroma or leaf tissue, merging with the clypeus at the apex.

Within the three sub-families mentioned above, the genera were classified according to the colour and septation of the spores and the presence or absence of paraphyses.

In 1924, after a detailed study of *Phyllachora graminis* on *Agropyrum repens*, Petrak (3) came to the conclusion that *Phyllachora* cannot be regarded as a dothideal form; he pointed out the great similarity between *Phyllachora graminis* and *Physalosporina Astragali*, the only difference being in the colour and consistency of the stroma and of the perithecial membrane. In *Phyllachora* the stroma becomes thickened in the epidermis on either side of the leaf into a black, intra-epidermal clypeus which does not stain blue with iodine; the stroma tissue in many species becomes more or less brittle with age and the perithecial wall is often rather weakly membranous, but never fleshy. In *Physalosporina*, the stroma tissue under the epidermis becomes more or less coloured but is never dark, it forms no clypeus and stains blue black with iodine; the perithecial wall is more or less gelatinous and fleshy. Petrak considers that *Polystigma*, *Physalosporina* and *Phyllachora* are closely related genera which form a natural family. *Phyllachora* is not closely related to the true dothideal fungi.

A few months later, Orton (2) published the result of his studies of the development of *Phyllachora graminis* on *Agropyrum repens*. He also came to the conclusion that *Phyllachora graminis* cannot be considered a dothideaceous fungus, but must be regarded as a reduced type of *Sphaeriaceae*. He was of the opinion, however, that this fungus does not develop a true stroma; there is a progressive development of individual ascocarps within, any infected host area; the clypeus is clearly a special structure, its function being apparently that of a protective membrane.

The subdivision of the *Phyllachoraceae* on the basis of the position of the stroma, Petrak (4) regards as purely artificial. In the characterisation of the genus *Catacauma* of the sub-family *Scirrhiineae*, it is stated that the stroma develops between the epidermis and the sub-epidermal layers of cells. This is only true in a limited sense; the perithecia develop under the epidermis and between them there is connecting stroma, but, in addition hyphae push into the mesophyll more or less freely and may extend to the opposite side of the leaf and develop a rudimentary clypeus in the epidermis.

Petrak is of the opinion that the position of the perithecia is correlated with the texture of the leaf in which the fungus grows. Most *Catacauma spp.* occur on leaves which are more or less hard or leathery, e.g. those of *Ficus spp.*; in such leaves penetration into deeper cell layers is difficult and the perithecia develop under the epidermis. He has no doubt that all, or most of the *Catacauma* forms have been derived and modified from different species of *Phyllachora* and are more closely related to such *Phyllachora spp.* than to other *Catacauma* forms. *Catacauma* is therefore untenable as a genus and must be included in *Phyllachora*.

*Trabutia*, which was made by Theissen and Sydow the type genus of the sub-family *Trabutiineae*, is a mixed genus. Petrak (5) finds that the type species, *Trabutia quercina*, is a true dothideaceous fungus, and he mentions several other species which are similar in structure. All other species known to him, including some South African forms occurring on *Ficus*, are not dothideal but sphaerial in structure and none other than subcuticular *Phyllachora spp.*

With reference to the characterisation of genera "with" or "without paraphyses", Petrak points out that all true *Phyllachoraceae* have paraphyses, even if these are transitory, reduced, or early dissolve into mucilage. The presence or absence of paraphyses in mature perithecia cannot therefore be maintained as a generic distinction.

Of the generic distinctions employed by Theissen and Sydow (7) there remain only to be considered the colour and septation of the spores. Petrak (3) states that in most species of *Phyllachora* the spores are at first hyaline but become more or less yellowish or yellowish brown when fully mature. It is true that with age the spores develop a pale yellowish brown or bronze tinge, but this differs from the definite snuff brown or olive brown pigmentation of the spores found in some other genera; this pigmentation develops early in the maturing spores and the difference between this and the tinting in old *Phyllachora* spores appears to be more than one of degree.

Of the fungi assigned to genera characterised by the brown colour of the spores, the type species of *Sphaerodothis, Sph. Arengae* (Rac.) Shear, has pale tinted spores which do not differ from fully mature or old *Phyllachora* spores. *Phaeochora Neowashingtoniae* (Shear) Th. et Syd. has large, elongated, definitely brown spores and those of *Phaeochorella Parinarii* (P. Henn.) Th. et Syd., a South African fungus, are smaller, oblong, snuff brown to olive brown with a medial, hyaline band. In Theissen and Sydow's key, *Phaeochorella* is separated from *Phaeochora* only by the presence of paraphyses, said to be lacking in *Phaeochora*. Until further studies have been made, however, the generic name *Phaeochorella* will be retained for the South African fungus.

Of the genera with 2-celled, hyaline spores, South African species of *Endodothella*, with Phyllachora-like stroma have been described. If there is no difference between this genus and *Placostroma* with Catacauma-like stroma besides the position of the perithecia, the species of *Endodothella* should fall into the genus *Placostroma* which has precedence; Clements and Shear (1) consider *Endodothella* a synonym for *Placostroma*. In recent mycological literature, however, the genus *Endodothella* has been retained and no change has therefore been made in the nomenclature of the South African species.

Of the 70 South African species described in the following pages, 64 belong to the genus *Phyllachora*, including forms previously described as *Catacauma* or *Trabutia*. There is one species of *Diachora*, a genus with 1-celled, hyaline spores of which the systematic position is ambiguous and of which a detailed generic description is given. The remaining 5 fungi are forms with Phyllachora-like stroma and perithecia, differing only in the colour, form and septation of the spores. Until further and more comprehensive studies have been made of Phyllachora-like genera which differ in spore characters, these genera may be distinguished as follows:—

A.—Spores ellipsoid or oblong.
  (*a*) Spores 1-celled.
    1. Spores hyaline or slightly tinted..... *Phyllachora.*
    2. Spores definitely brown..... *Phaeochorella.*
  (*b*) Spores 2-celled, hyaline..... *Endodothella.*
B.—Spores filiform..... *Ophiodothella.*

In the following pages, the species of *Phyllachora* are grouped according to the family of the host plant. The families are in the sequence found in "The Genera of South African Flowering Plants", by Dr. E. P. Phillips (6), which is based on Engler's system of classification.

I am indebted to Dr. H. Sydow for help with some of the critical species and for verifying some of the identifications by comparison with the type specimens to which he has access. I am also indebted to my colleagues in the Phanerogamic herbarium for revising the nomenclature of the host plants, particularly to Miss I. C. Verdoorn and Miss H. Forbes, who examined the Dicotyledons, and to Miss L. C. Chippindall, who identified all the grasses.

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## PHYLLACHORA Nke.

On CRYPTOGAMS.

**Phyllachora Hieronymi** P. Henn.

Pilze Ostafr. apud A. Engler, Die Pflanzenwelt Ostafrikas (1895) p. 34 ; Theiss. and Syd., Ann. Myc. 13 (1915) p. 438 ; Doidge, Bothalia I (1921) p. 28.

Stromata epiphyllous, grouped on indeterminate, yellowish brown leaf spots, convex, shining black, more or less circular in outline, 0·4-0·5 mm. diam. ; usually in irregular groups, which are frequently elongated along the veins, occasionally dendritic ; visible also on the under side of the leaf, where they are more or less convex and usually dull black.

Clypeus well developed in the upper epidermis, 30–33 $\mu$ thick, composed of subopaque, blackish brown hyphae 3·5-5 $\mu$ thick. In the lower epidermis the clypeus is short and ca. 20 $\mu$ thick. When the base of the perithecium does not quite reach the lower clypeus, the intervening space is filled with brown stromatic tissue.

Perithecia usually solitary, but occasionally a few are crowded together under one clypeus, globose or flattened globose, usually occupying the whole thickness of the leaf, 250–350 $\mu$ diam., 180–250 $\mu$ high. Perithecial wall not well defined, pale brown, concentric fibrose, merging above and below with the clypeus ; when two perithecia are in contact, the common wall is dark brown, firm and ca. 10 $\mu$ thick. Ostiole flat, papilliform, completely immersed in the clypeus, with rather short, hyaline periphyses. Asci numerous, 8-spored, cylindrical or cylindrical-clavate, rounded above, attenuated below to a short stalk, 65–70 × 16–20 $\mu$. Spores obliquely monostichous or incompletely distichous, 1-celled, hyaline, oblong-ellipsoid, tapering slightly to rounded ends, 20–24 × 6–8 $\mu$. paraphyses numerous, very fine, filamentous, ca. 1 $\mu$ thick.

On *Cyathea Dregei* O. Kze., on leaves, Winter's Kloof, Natal, *Doidge*, 1666.

On GRAMINEAE : Tribe ANDROPOGONEAE.

**Phyllachora Chrysopogonis** Syd.

Bothalia I (1924) p. 219.

Stromata amphigenous, not on leaf spots, more or less evenly distributed over the leaf surface; the tissues of the host in the vicinity of the stromata are somewhat discoloured and the leaf early becomes light brown and dry. Stromata usually discrete, rarely confluent, rather dull black, elliptic, ½–1 mm. long, slightly convex.

Clypeus usually only in the epidermis over the perithecia and not extending much beyond them, black, opaque, 15–25 $\mu$ thick ; occasionally there are traces of clypeus formation in the opposite epidermis. At the margin of the stroma, the perithecia are surrounded by stromatic tissue consisting of dark brown, septate hyphae 1·5–4 $\mu$ thick, which may be quite loosely and irregularly branched and interwoven, or more or less compact, erect, prosenchymatous.

Perithecia 1–4 in each stroma, usually closely crowded and occupying half to two-thirds of the thickness of the leaf, ellipsoid to lenticular, 300–420 $\mu$ diam., 100–170 $\mu$ high. Perithecial wall brown, well developed at the sides, 15–20 $\mu$ thick, less sharply defined and paler at the base, where it presses against the cells of the host, concentric fibrose, composed of delicate hyphae 1–1·5 $\mu$ thick. Asci copiously paraphysate, 8-spored, cylindrical, 65–85 × 10–14 $\mu$. Spores usually monostichous, oblong, broadly rounded at both ends, continuous, hyaline, 12–15 × 7–8 $\mu$.

On *Chrysopogon montanus* Trin. var. *tremulus* Stapf, on leaves and sheaths, Vryburg, *Pole Evans*, 9302.

**Phyllachora Doidgeae** Syd.

Bothalia I (1924) p. 220.

Stromata amphigenous, not on leaf spots, but with some indefinite yellowish brown or reddish brown discoloration of the leaf tissues in the immediate vicinity, scattered irregularly or in short series, discrete, elliptic, ½–1 mm. long, dull black, slightly convex, often visible but less conspicuous on the opposite side of the leaf.

Clypeus well developed in the epidermis over the perithecia and not extending beyond them, 30–40 $\mu$ thick, composed of subopaque, blackish brown hypae 2·5–4 $\mu$ thick ; not so extensive, less dense and 10–20 $\mu$ thick in the opposite epidermis. When the base of the perithecium does not reach the epidermis, the intervening cells of the host are filled with closely cellular, hyaline or light brown fungous tissue, which sometimes extends laterally beyond the perithecium.

Perithecia 1–4 in each stroma, deeply immersed, flattened-globose to lenticular, 300–500 μ diam., 200–300 μ high. Perithecial wall 10–15 μ thick, concentric fibrose, composed of rather delicate, pale or darker brown hyphae 2–2·5 μ thick. Ostiole flat, obtusely conical, completely immersed in the clypeus, traversed by a pore 25–30 μ broad. Asci 8-spored, cylindrical, 80–100 × 12–16 μ. Spores obliquely or transversely monostichous or incompletely distichous, oblong, broadly rounded at both ends, continuous, hyaline 14–18 × 8–10 μ. Paraphyses numerous, filamentous, exceeding the asci.

Conidiferous loculi present in the same stromata, similar to the perithecia but usually smaller, 175–250 μ diam., 140–170 μ high. Conidia oblong or oblong-fusoid, obtuse at both ends or tapering somewhat, continuous, pale fuscous, 8–12 × 2–3 μ. Basidia none.

On *Monocymbium ceresiiforme* Stapf (= *Andropogon ceresiaeforme* Nees) Durban, *Doidge*, 1612, Type; Edendale, *Doidge*, 1998; Nelspruit, *Liebenberg*, 26036; Godwan River, *Liebenberg*, 26055.

*Cymbopogon marginatus* (Steud.) Stapf, Donkerpoort, *Doidge and Bottomley*, 29744; Derdepoort, *Doidge and Bottomley*, 29800.

*Hyparrhenia cymbaria* Stapf, Schagen, *Liebenberg*, 29869.

*Hyparrhenia hirta* Stapf, Debbe's Ravine, Pretoria District, *Mogy*, 29852; Skinner's Court, Pretoria, *Doidge*, 23425; Derdepoort, *Doidge and Bottomley*, 29801; Mamathes, Basutoland, *Hean*, 32427; Taylor's, near Maritzburg, *Doidge*, 32785.

A form on *Cymbopogon excavatus* Stapf, which is probably only a variation of *Phyllachora Doidgeae* Syd., may be described as follows:—

Stromata epiphyllous, on definite brown leaf spots, penetrating more or less to the under side of the leaf, scattered or in small groups or series, dull black, raised, oval to linear, ½–4 mm. long and up to 1 mm. broad.

Clypeus extensive in the upper epidermis, dense black, 25–37·5 μ thick; poorly developed in the lower epidermis. The space between the base of the perithecia and the lower clypeus is filled with pale brown, closely parenchymatous stromatic tissue, which often extends laterally beyond the clypeus and is connected with adjacent stromata; it is most compact in the epidermal cells.

Perithecia numerous, deeply immersed, lenticular to irregularly spherical, 100–500 μ diam., 150–200 μ high. Perithecial wall 10–20 μ thick, concentric fibrose, consisting of light brown, delicate hyphae 1–1·5 μ thick. Asci numerous, 8-spored, cylindrical, 100–125 × 11–15 μ. Spores directly or obliquely monostichous, 1-celled, hyaline, ellipsoid to oval, broadly rounded at both ends, 12–15 × 6–9 μ. Paraphyses numerous, exceeding the asci.

On *Cymbopogon excavatus* Stapf, Derdepoort, *Doidge and Bottomley*, 29805; Schagen, *Liebenberg*, 29856.

*Phyllachora Doidgeae* is often parasitised. Several parasitic forms were found, especially on No. 29744; on this collection *Cryptodidymosphaeria clandestina* Syd. was particularly well developed, and in this collection were also found two fungi inperfecti, *Coniothyrium occultum* Syd. and *Staganospora cryptogea* Syd. The host of *Pleospora Doidgeae* Petr. is also probably this species.

**Phyllachora Elyonuri** Doidge nov. spec.

Stromata epiphylla, sine maculis, sparsa vel gregaria, saepe breviter seriata, atra, oblonga, 0·3–1 mm. longa, ¼–½ mm. lata, confluendo etiam longiora, usque 2 mm., vix nitidula; clypeo epidermali bene evoluto in epiphyllo, usque 37·5 μ crasso, carbonaceo, parenchymatice contexto, atro-brunneo, in hypophyllo haud vel parce evoluto praedita; stromate in mesophyllo ex hyphis tenuibus plectenchymatice contextis composito. Perithecia pauca usque numerosa in quoque stromate, ½ vel ¾ folii crassitudinis occupantia, applanato-globosa v. e mutua pressione irregularia, 150–300 μ diam., in centro stromatis usque 150 μ, prope marginem 100 μ alta; ostiolo plano papilliformi clypeo immerso praedita; pariete perithecii ca 6–10 μ crasso, concentrice fibroso. Asci copiose paraphysati, 8-spori, cylindracei v. cylindrico-clavati, 70–87·5 × 11–15 μ. Sporae oblique, vel transverse monostichae, subinde fere distichae, hyalinae, continuae, ellipsoideae, 7·5–11 × 6–7·5 μ.

Hab. in foliis *Elyonuri glabri* var. *villosi*, Donkerpoort, prope Pretoria, leg *Doidge et Bottomley*, 29748.

Stromata epiphyllous, not on leaf spots, scattered, in short series or irregularly grouped, oblong, black, somewhat shining and convex, 0·3–1 mm. long, 0·25–0·5 mm. broad, often becoming confluent in short series and forming compound stromata up to 2 mm. long.

Clypeus usually well developed in the upper epidermis, black, opaque, carbonaceous, variable in thickness, up to 37·5 μ thick between the perithecia, ca. 15 μ thick near the

ostioles ; sometimes less dense and opaque, composed of small, dark brown parenchymatous cells, or interrupted by lacunae filled with rather loosely interwoven hypae. The cuticle is usually not involved and can be seen covering the clypeus. Clypeus absent from the lower epidermis or comparatively poorly developed. The stroma between and below the perithecia consists of light brown hyphae, more or less closely interwoven, which become paler and subhyaline as they penetrate into the mesophyll at the base of the perithecia.

Perithecia few (2 or more) in simple stromata, numerous (up to 14 observed) in compound stromata, occupying half to three-quarters of the thickness of the leaf, monostichous, flattened globose, or, when closely crowded, sometimes becoming irregular and subdistichous, 150–300 $\mu$ diam., up to 150 $\mu$ high in the centre of the stroma and 100 $\mu$ near the margins. Perithecial wall concentric fibrose, 6–10 $\mu$ thick, formed of light brown hyphae ca. 1·5 $\mu$ thick. Ostiole flat, papilliform, completely immersed in the clypeus, with a pore ca. 20 $\mu$ diam. Asci copiously paraphysate, 8-spored, cylindrical or cylindrical-clavate, 70–87·5 × 11–15 $\mu$. Spores obliquely or transversely monostichous, occasionally subdistichous, continuous, hyaline, ellipsoid, 7·5–11·5 × 6–7·5 $\mu$.

On *Elyonurus glaber* Phillips var. *villosus* Phill., on leaves, Donkerpoort, Pretoria District, *Doidge and Bottomley*, 29748.

*Elyonurus argenteus* Nees, Donkerpoort, *Doidge and Bottomley*, 30076.

**Phyllachora Bottomleyae** Doidge nov. spec.

Stromata sine maculis sed fere semper decolorationes rufo-brunneolas efficientia, laxe sparsa vel in greges laxos vel subdensos, elliptica, minuta, usque 1 mm. longa, confluendo etiam majora ; clypeo tantum in epiphyllo bene evoluto, atro-brunneo, opaco, usque ad 50 $\mu$ crasso, microparenchymatico. Perithecia complura, depresso-globosa vel late ellipsoidea, 180–350 $\mu$ diam., 100–180 $\mu$ alta, ostiolo plano, papilliformi periphysato, clypeo omnino immerso praedita ; pariete perithecii 8–14 $\mu$ crasso, concentrice fibroso, pallide brunneo ; asci 8-spori, cylindracei, 80–87·5 × 10–13·5 $\mu$ ; sporae oblique monostichae, hyalinae, continuae, ellipsoideae, 9–12·5 × 5–6·25 $\mu$ ; paraphyses hyalinae, filiformes.

Hab. in foliis *Ischaemi arcuati*, Donkerpoort, prope Pretoria, leg. *Doidge et Bottomley*, 29777.

Not on leaf spots ; there is some discoloration of the tissues of the host near the stromata and affected leaves rapidly become reddish brown and dry. Stromata epiphyllous, scattered or in irregular groups of varying size, minute, elliptic, 0·3–1 mm. long, 0·25–0·3 mm. broad, occasionally becoming confluent, convex, dull black.

Clypeus well developed in the upper epidermis, at first golden brown, becoming blackish brown, opaque, up to 50 $\mu$ thick and microparenchymatous in structure. Stroma between the perithecia, which are often rather remote from one another, plectenchymatous, consisting of rather loosely interwoven, light brown hyphae, 2·5–4 $\mu$ thick ; stroma in the mesophyll hyaline, extending beyond the clypeus and to the lower epidermis, where there is often a trace of clypeus formation ; this is golden brown to dark brown and is not extensive.

Perithecia several in each stroma, deeply immersed, flattened globose to ellipsoid, 180–350 $\mu$ diam., 100–180 $\mu$ high. Ostiole flat, papilliform, periphysate, completely immersed in the clypeus and traversed by a pore ca. 20 $\mu$ broad. Perithecial wall well developed, 8–14 $\mu$ thick, concentric fibrose, composed of delicate, light brown hyphae 1–1·5 $\mu$ thick. Asci paraphysate, 8-spored, cylindrical, straight or curved, 80–87·5 × 10–13·5 $\mu$. Spores obliquely monostichous, hyaline, continuous, ellipsoid, 9–12·5 × 5–6·25 $\mu$. Paraphyses slender, hyaline, filamentous.

On *Ischaemum arcuatum* Stapf, on leaves, Donkerpoort, Pretoria District, *Doidge and Bottomley*, 29777, 31010, 31017.

This fungus differs from *Phyllachora Ischaemi* Syd.

**Phyllachora Miscanthidii** Doidge nov. spec.

Stromata sine maculis, amphigena, sed in epiphyllo magis conspicua et magis convexa, opace atra, sparsa, oblonga, 0·5–1 mm. longa, usque 0·5 mm. lata, in utraque pagina clypeo atro, vix vel parum nitidulo 30–40 $\mu$ crasso, subcarbonaceo, indistincte parenchymatico praedita. Perithecia 2–3 in quoque stromate, lenticularia v. irregularia, 450–600 $\mu$ longa, 150–200 $\mu$ alta et lata, ostiola plano, papilliformi, clypeo omnino immersa praedita ; pariete perithecii ca. 6–8 $\mu$ crasso, concentrice fibroso, parce evoluto. Asci 8-spori, paraphysati, cylindracei v. cylindraceo-elliptici, 125–125 × 17–20 $\mu$, rarissime clavati, ca. 90 $\mu$ longi et 30 $\mu$ lati, antice rotundati, postice plus minusve attenuati, pedicello mox brevi mox plus

minus elongato, firme crasseque tunicati. Sporae oblique monostichae v. disrichae, ellipsoideae v. subclavatae, utrinque leniter attenuatae, 22–27·5 × 7·5–10 μ; superne obtuse rotundatae, inferne subcuneatae, saepe mucronatae vel in setum usque 8 μ longum productae. Conidia simul praesentia, gracillima, continua, varie curvata, filiformia, 20–25 μ longa, ca. 0·5 μ tantum crassa.

Hab. in foliis *Miscanthidii Sorghi*, in silvis Xumeni, prope Donnybrook, leg. *Doidge*, 31011.

Not on leaf spots, but there is some discoloration of the tissues in the vicinity of the stromata, and the leaf finally becomes reddish brown. Stromata visible on both sides of the leaf, but more conspicuous on the upper surface, widely scattered, usually discrete, very rarely becoming confluent, oblong, slightly convex, 0·5–1 mm. long and 0·3–0·5 mm. broad, black, somewhat shiny.

Clypeus well developed in the epidermis on both sides of the leaf, dense black, opaque, 30–40 μ thick, indistinctly parenchymatous. When perithecia are not in contact, the intervening space is filled with stromatic tissue consisting of erect, parallel, palisade-like brown hyphae about 2 μ thick.

Perithecia 2–3 in each stroma, occupying the whole, or at least three-quarters of the thickness of the mesophyll, lenticular to irregular in longitudinal section, round in transverse section, 450–600 μ long, 150–200 μ high and broad. Ostiole flat, papilliform, completely immersed in the clypeus. Perithecial wall not very well differentiated, 6–8 μ thick, concentric fibrose, formed of rather delicate, light brown hyphae, ca. 1–1·5 μ thick. Asci paraphysate, 8-spored, usually cylindrical or cylindrical-ellipsoid, sometimes tapering somewhat to the rounded apex, narrowed below into a stalk which is usually short but sometimes more elongated, 125–135 × 17–20 μ; occasionally clavate, ca. 90 μ long and 30 μ broad; with a firm thick wall ca. 2–2·5 μ thick. Spores obliquely monostichous to distichous hyaline, continuous, ellipsoid to ellipsoid-clavate, 22–27·5 × 7·5–10 μ, tapering somewhat to both ends, upper end rounded, lower acute, mucronate or prolonged into a fine bristle up to 8 μ long; rarely the spore is broader near the acute end. Paraphyses hyaline, filiform.

Conidia produced in great numbers in the same stromata, hyaline, very slender, filiform, continuous, curved in various ways, 20–25 μ long and ca. 0·5 μ thick.

On *Miscanthidium sorghum* (Nees) Phil., on leaves, Xumeni Forest, near Donnybrook, Natal, *Doidge*, 31011 Type; Kentani, *Pegler*, 8348, 9169; Gala Bush, near Donnybrook (conidial stage only), *Doidge*, 31013.

*Miscanthidium capense* Stapf, Verulam, Natal, *James*, 32675.

The fungus on *Miscanthidium capense* is old and parasitised, but there is no doubt that it is the same species as on *M. sorghum*.

**Phyllachora Schizachyrii** Doidge nov. spec.

Stromata sine maculis, decolorationes rufo-brunneas indistincte definitas tantum efficientia, amphigena, plerumque epiphylla, sparsa, saepe aggregata et confluentia, in epiphyllo magis conspicua et magis convexulo prominentia, ovalia, usque ad 2 mm. longa et 1 mm. lata; clypeo in utraque v. unica folii pagina bene evoluto, 12·5–20 μ crasso, atro-brunneo, microparenchymatico praedita. Stromate in mesophyllo ex hyphis 1·5–3 μ crassis laxe reticulato-contextis vel plerumque inter perithecia bene evoluto pellucide brunneo plus minus verticaliter prosenchymatico. Perithecia numerosa, ellipsoidea depresso-globosa v. irregularia, totum vel fere totum spatium inter ambas epidermides occupantia, 150–600 μ lata, 200–350 μ alta; pariete ubique bene evoluto, circiter 8–16 μ crasso, concentrice fibroso; ostiolo plano papilliformi, poro ca. 10 μ lato aperto. Asci 8-spori, paraphysati, cylindracei, 75–100 × 10–12·5 μ. Sporae monostichae, hyalinae, continuae, late ellipsoideae, utrinque rotundatae, 10–15 × 6–7·5 μ.

Hab. in foliis *Schizachyrii semiberbis*, Donkerpoort prope Pretoria, leg. *Doidge et Bottomley*, 29747.

Not on definite leaf spots, but the tissues of the host become discoloured in the vicinity of the stromata and affected leaves early become red and dry. Stromata amphigenous, mostly epiphyllous, scattered or in groups, often numerous and becoming confluent, usually more conspicuous and more convex on the upper than on the lower leaf surface, oval, up to 2 mm. long and 1 mm. broad.

Clypeus well developed in the epidermis over the perithecia; in the opposite epidermis sometimes well developed, sometimes not so well developed and less extensive or even absent. Clypeus formed of small-celled parenchymatous tissue at first light brown, becoming

blackish brown, opaque, 12·5–20 μ thick. Stroma in the mesophyll plectenchymatous, consisting of rather loosely interwoven, pale olive brown hypae 1·5–3 μ thick, tending to become more compact and prosenchymatous between the perithecia.

Perithecia few or numerous in each stroma, ellipsoid, flattened globose or irregular, often crowded and compressed laterally, deeply immersed, 150–600 μ diam., 200–350 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, with a pore ca. 10 μ broad. Perithecial wall well developed, concentric fibrose, 8–16 μ thick, composed of rather delicate, olive brown hyphae, 1·5–2 μ thick. Asci paraphysate, 8-spored, cylindrical, 75–100 × 10–12·5 μ. Spores monostichous, broadly ellipsoid, hyaline, continuous, broadly rounded at both ends, 10–15 × 6–7·5 μ. Paraphyses very numerous, filiform.

On *Schizachyrium semiberbe* Nees, on leaves, Donkerpoort, Pretoria District, *Doidge and Bottomley*, 29747, 29778.

**Phyllachora anthistiriicola** Syd.

Bothalia I (1924) p. 219.

Not on definite leaf spots, but causing some discoloration of the leaf tissues in the vicinity of the stroma and affected leaves rapidly become brown and dry. Stromata amphigenous but mostly epiphyllous, distributed irregularly over the leaf surface, sometimes scattered, sometimes grouped irregularly, very frequently numerous, crowded and almost covering large areas of the upper leaf surface. Single stromata 0·5–1 mm. long, not infrequently becoming confluent, convex on the upper side of the leaf, flat on the lower side and often consisting of only a sterile stroma or an epidermal clypeus.

Clypeus dense black, 20–30 μ thick in the epidermis over the perithecia; absent from the opposite epidermis or poorly developed and not continuous.

Perithecia up to 5 in a single stroma, ellipsoid or globose, often crowded and flattened laterally by mutual pressure, 200–350 μ diam., 170–200 μ high, deeply immersed. Ostiole flat, papilliform, completely immersed in the clypeus, with a pore 20–25 μ broad. Perithecial wall 5–10 μ thick, concentric fibrose, consisting of rather delicate, light brown hyphae ca. 1·5 μ thick. Asci paraphysate, cylindrical, 8-spored, 70–80 × 12–16 μ. Spores obliquely or transversely monostichous to distichous, hyaline, continuous, oblong, broadly rounded at both ends, 11–16 × 7–9 μ.

Conidia present in the same stromata, filiform, straight or curved, hyaline, 12–15 × 0·5 μ.

On *Themeda triandra* Forsk. (= *Anthistiria imberbis*) Magaliesberg, *van der Byl*, 2196, Type; Birchleigh, *Hean*, 30069.

On GRAMINEAE: Tribe ARUNDINELLAE.

**Phyllachora Arundinellae** Doidge nov. spec.

Stromata sine maculis, decolorationibus angustis brunneolis indefinitis cincta, epiphylla sed in utraque folii pagina visibilia, in greges plus minus elongatas disposita vel densiuscule dispersa, leniter convexula, minutissima, oblonga v. linearia, usque ad 1 mm. longa; clypeo epiphyllo 15–45 μ crasso, plerumque plus minus opace atrobrunneo, ex hyphis olivaceo-brunneis 2·5–4 μ latis contexto, in hypophyllo pro ratione parce evoluto et usque 20 μ crasso, haud continuo; stromata in mesophyllo bene evoluto, ex hyphis reticulato ramosis hyalinis usque ad 5 μ crassis composito. Perithecia pauca in quoque stromate, saepe tantum 1 vel 2, interdum usque 5, lenticularia vel ellipsoidea, totam folii crassitudinem occupantia, 160–320 μ diam., 100–120 μ alta; ostiolo plano papilliformi, clypeo omnino immerso poro valde indistincto praedita; pariete perithecii circiter 6–12 μ crasso, concentrice fibroso, flavo-brunneolo. Asci paraphysati, 8-spori, cylindracei, breviter pedicellati, 60–80 × 13–15 μ. Sporae distichae, hyalinae, continuae, ellipsoideae, utrinque rotundatae, 12·5–15 × 5–6·25 μ.

Hab. in foliis *Arundinellae Ecklonii*, Nelspruit, leg. Liebenberg, 26019.

Not on definite leaf spots, but causing some light brown discoloration of the leaf tissues in the vicinity of the stromata. Stromata in elongated groups or thickly scattered over the whole leaf surface, epiphyllous, visible on both sides of the leaf, dull black, only slightly convex, very minute, oblong to linear, up to 1 mm. long, only occasionally becoming confluent.

Clypeus in the upper epidermis either well developed, brownish black, opaque, 15–45 μ thick, or, in places, less dense and consisting of loosely or closely interwoven, tortuous, olive brown hypae 2·5–4 μ thick, which occasionally only partly fill the large epidermal cells. Clypeus in the lower epidermis, comparatively poorly developed, up to 20 μ thick

and not continuous. Stroma in the mesophyll well developed, and rather extensive, hyaline or subhyaline, plectenchymatous, consisting of closely interwoven hyphae up to 5 μ thick.

Perithecia few in each stroma, often 1–2, less frequently up to 5, lenticular or ellipsoid, sometimes crowded and becoming angular through lateral pressure, occupying the whole thickness of the leaf, 160–320 μ diam., 100–120 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, pore ill-defined, often very indistinct, ca. 15–20 μ broad. Perithecial wall delicate, yellowish brown, concentric fibrose, 6–12 μ thick. Asci paraphysate, 8-spored, clavate or clavate-cylindrical, with a short stalk, 60–80 × 13–15 μ. Spores distichous, hyaline, continuous, ellipsoid, rounded at both ends, 12·5–15 × 5–6·25 μ.

On *Arundinella Ecklonii* Nees, on leaves and sheaths, Nelspruit, *Liebenberg*, 26019, Type; Debbe's Ravine, Pretoria District, *Bottomley*, 29866; Silverton Ridge, *Doidge*, 23422; Rooiwal, Eastern Transvaal, *Bosman*, 29857; Wolwekloof, Pretoria District, *Bottomley*, 32873; Nottingham Road, *McClean*, 32293.

**Phyllachora Loudetiae** Doidge nov. spec.

Stromata sine maculis, sparsa, in greges minutos vel in series breves longitudinales saepe disposita, amphigena, plerumque epiphylla, et in epiphyllo magis conspicua et magis convexa, minuta, opace atra, oblonga, usque ad 0·5 mm. longa: clypeo in epiphyllo bene evoluto, atro, opaco, carbonaceo, usque 50 μ crasso, in hypophyllo multo minus evoluto usque 10 μ crasso; stromate in mesophyllo ex hyphis 1·5–3 μ latis plectenchymatice contextis, subhyalinis v. olivaceo-brunneis composito. Perithecia plerumque 1–2 in quoque stromate, totam folii crassitudinem occupantia, ellipsoidea v. lenticularia, 270–550 μ diam., 150–170 μ alta, ostiolo plano, papilliformi, clypeo omnino immerso, periphysato praedita; pariete perithecii bene evoluto, 6–13 μ crasso, ex hyphis brunneis 2–2·5 μ crassis composito. Asci paraphysati, 8-spori, cylindracei, 70–90 × 10–12 μ. Sporae oblique v. fere transverse monostichae, hyalinae, continuae, late ellipsoideae v. subglobosae, 8·5–10·5 × 7·5–8·5 μ.

Hab. in foliis *Loudetiae simplicis*. Donkerpoort, prope Pretoria, leg. Doidge et Bottomley, 29775.

Not on leaf spots, but badly affected leaves early become reddish brown and dry. Stromata amphigenous, mostly epiphyllous, but visible on both sides of the leaf, dull black, minute, scattered, in small groups or short series, oblong, up to 0·5 mm. long, slightly convex and more conspicuous on the upper side of the leaf.

Clypeus well developed in the upper epidermis, black, opaque, up to 50 μ thick, composed of dark brown, tortuous and closely interwoven hyphae 2–2·5 μ thick: not so well developed in the lower epidermis, less extensive and about 10 μ thick; between the perithecia and at the margins of the stroma, stroma consists of loosely reticulate hyphae, hyaline to dark brown, 1·5–3 μ thick.

Perithecia usually occupying the whole thickness of the leaf, 1–2 in each stroma, rarely more, ellipsoid to lenticular, 270–550 μ diam., 150–170 μ high; ostiola flat, papilliform, periphysate, completely immersed in the clypeus, traversed by a rather indefinite pore ca. 20 μ broad; perithecial wall well developed and comparatively dark brown, 6–12 μ thick, composed of rather thin-walled, olive brown hyphae 2–2·5 μ thick. Asci numerous, paraphysate, 8-spored, cylindrical, thin-walled and disappearing early, 70–90 × 10–12 μ. Spores obliquely or transversely monostichous, continuous, hyaline, broadly ellipsoid to subglobose, 8·5–10·5 × 7·5–8·5 μ.

On *Loudetia simplex* (Nees) Hubb., on leaves and sheaths, Donkerpoort, Pretoria District, *Doidge and Bottomley*, 29775, 29756.

On GRAMINEAE: Tribe BAMBUSEAE.

**Phyllachora permutata** Petrak.

Ann. Myc. 25 (1927) pp. 268–270.

As *Telimena Arundinariae* Doidge in Bothalia I (1922) p. 69.

Stromata few, widely scattered, or if more numerous, distant from one another, borne singly on yellowish or yellowish brown leaf spots. Leaf spots visible on both sides of the leaf, more or less sharply defined, up to 2 mm. long and 0·5–1 mm. broad, seldom longer. Stroma in the centre of each spot, round, broadly elliptic or somewhat irregular, 300–600 μ diam., flat or slightly convex on the lower side of the leaf, on the upper side strongly convex, about 250–300 μ high.

Upper clypeus 30–40 μ thick, sometimes up to 80 μ thick at the apex, sharply defined at the edges, composed of blackish brown, opaque, indefinitely cellular tissue; lower clypeus less extensive, comparatively poorly developed and lighter in colour. Stroma in the mesophyll poorly developed, hyaline or subhyaline.

Perithecia single in the smaller stromata, subglobose, 250–400 μ diam.; usually 2 in the larger stromata; ostiole flat, immersed in the clypeus, pore more or less round, not sharply defined, 30–40 μ broad; perithecial wall delicate, concentric fibrose, hyaline or light greyish brown. Asci cylindrical or somewhat fusiform, broadly rounded above, narrowing below into a short, thick stalk, or subsessile, rather thin-walled, 8-spored, paraphysate, 90–120 × 15–23 μ. Spores monostichous, rarely subdistichous, continuous, hyaline, ellipsoid or ovate, straight or slightly curved, 16–25 × 7·5–9·5 μ. Paraphyses numerous, breaking down early and becoming unrecognisable.

On *Arundinaria tessellata* Munro, on leaves, Goodoo Bush, near Mont-aux-Sources, Natal, *Doidge*, 14103.

The asci and 4-celled spores described as those of *Telimena Arundinariae* Doidge (l.c.) are probably those of a second fungus parasitic in the stroma of the Pyhllachora (Petrak l.c.); unfortunately this fungus is poorly developed and the material insufficient for further study. It is possibly a species of Leptosphaeria.

On GRAMINEAE: Tribe CHLORIDEAE.

**Phyllachora Cynodontis** (Sacc.) Niessl.

Not. pyren. p. 54; Syll. Fung. II, p. 602; Theissen and Sydow., Ann. Myc. 13 (1915) p. 447.

Not on leaf spots but causing a slight yellowish brown discoloration of the leaf tissues in the immediate vicinity of the stroma. Stromata visible on both sides of the leaf, but usually more conspicuous and more definitely convex on the upper side, round to angular, scattered, rarely becoming confluent, 0·3–0·5 mm. diam.

Clypeus above the perithecia, usually on the upper side of the leaf, very well developed in the epidermis and the subepidermal cells, opaque, black, usually 30–35 μ thick, occasionally up to 85 μ thick, consisting of tortuously and closely interwoven hyphae 1·5–2·5 μ thick, at first light brown, becoming blackish brown and opaque. In the opposite epidermis, the clypeus may be lacking, poorly developed and limited in extent, or well developed. Between the perithecia, when these are not closely crowded, and at the margin of the stroma, the stroma is prosenchymatous and consists of vertical, parallel brown hypae about 2 μ thick. Elsewhere in the mesophyll the stroma is plectenchymatous, sparse or well developed, hyaline or light brown and composed of reticulately branched and interwoven hyphae, 1·5–2·5 μ thick.

Perithecia few, usually occupying the whole thickness of the leaf, sometimes not more than half its thickness, particularly when two stromata develop opposite one another; sometimes solitary, ellipsoid, up to 450 μ diam., and 200 μ high; more frequently 2–5 in a stroma, globose, or closely crowded and becoming angular or irregular through mutual pressure, central perithecia 100–200 μ diam., 150–200 μ high, marginal perithecia smaller, ca. 100–120 μ broad and high. Ostiole flat, papilliform, completely immersed in the clypeus, sparsely periphysate, with a pore 10–15 μ broad; perithecial wall well developed, concentric fibrose, composed of pale or darker brown hyphae 1·5–2 μ thick. Asci paraphysate, cylindrical to clavate, rounded above, sporiferous part 50–60 × 12–15 μ, narrowed at the base into a stalk which may be short or up to 15 μ long. Spores transversely or obliquely monostichous or incompletely distichous, hyaline, oval-ellipsoid, broadly rounded at both ends, 10–12 × 5·5–6 μ.

On *Cynodon Dactylon* Pers., on leaves, Pretoria, *Burtt Davy*, 145, 170, *Wager*, 23423; Groenkloof, Pretoria, *Burtt Davy*, 917; Vereeniging, *Burtt Davy*, 935; Cedara, Natal, *Fisher*, 1172; Bloemfontein, *Potts*, 11311; Irene, *S. Smuts*, 17016; Skinner's Court, *Bottomley*, 23424; Rietvlei, Pretoria District, *Acocks and Murray*, 32140; Buffelspoort, Rustenburg District, *Bottomley*, 25938 and *Doidge*, 27588; Jacksonstuin, *Doidge*, 32437; Schagen, *Liebenberg*, 26344; Donkerpoort, near Pretoria, *Doidge and Bottomley*, 29749; Potchefstroom, *Radloff* (*van der Byl 2100*); Tabamhlope, Natal, *West*, 29956; Nqutu, Zululand, *West*, 29957; Durban, *van der Byl 225*, 32455 and *McClean*, 32294; Brandfort, O.F.S., *Verwoerd* (*van der Byl 2366*); Knysna, *Bottomley*, 31015; Stellenbosch, *van der Byl 485*; Salisbury, S. Rhodesia, *Eyles 5336* (*van der Byl 2519*).

*Cynodon hirsutus* Stent, Rhebokkop, Rosendal, O.F.S., *Goossens*, 28816; Groenkloof, Pretoria, *Stent*, 24342.

*Cynodon incompletus* Nees, Pretoria, *Pole Evans*, 17, 1587.

*Cynodon plectostachyum* Pilg., Cedara, *Staples*, 17080.

This is a common and somewhat variable species on Cynodon throughout South Africa. Number 29749 is parasitised by *Cryptodidymosphaeria clandestina* Syd.

**Phyllachora Cynodontis** (Sacc.) Niessl. var. **Chloridis** P. Henn.

Pilz. Ostafrik. (1893) p. 34. Syll. Fung. XIV, p. 673.

Asci oblong or clavate, rounded above, 8-spored, sp. part 40–50 × 8–12 μ, pedicellate. Spores monostichous or subdistichous, ellipsoid, tapering slightly to broadly rounded ends, 8–11 ×5–6 μ.

On *Chloris pycnothrix* Trin., on leaves, without locality, 23467; Swaziland, *Burtt Davy*, 1602.

*Chloris gayana* Kunth., Durban, *van der Byl 797*, 31972, *van der Byl 226* and *Wager*, 32416.

This variety was described by Hennings from leaves of a Chloris collected in tropical Africa. The type has not been available for comparison, but the South African fungus on Chloris resembles *Phyllachora Cynodontis* and has spores similar in size to those of Hennings' variety. The material on *Chloris gayana* is old and badly parasitised.

Verwoerd and du Plessis record *Phyllachora chloridicola* on leaves and stems of a *Chloris* sp., from the Victoria Falls, collected by Eyles (van der Byl 658). I have not had an opportunity of examining this specimen.

**Phyllachora Leptocarydii** Syd.

Bothalia I (1924) p. 220.

Not on definite leaf spots, but causing a rather conspicuous light brown discoloration of the leaf tissues around the stromata. Stromata epiphyllous, scattered more or less evenly over the leaf surface, round to elliptic or somewhat irregular in outline, 0·3–0·6 mm. long, dull black, convex on the upper side of the leaf; visible also on the under side of the leaf, but there flat and less conspicuous.

Clypeus well developed in the upper epidermis, very dense black, 20–30 μ thick; occasionally there is also a well developed clypeus in the lower epidermis, but on the lower side it is usually brown, rather poorly developed and limited in extent or not continuous; at first composed of brown hyphae 2·5–3 μ thick, becoming indistinctly parenchymatous; stroma in the mesophyll poorly developed.

Perithecia few, 1–3 in each stroma, deeply immersed, occasionally reaching the lower epidermis, globose, 100–180 μ diam., or ellipsoid, up to 250 μ diam. and 90–160 μ high; ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a pore 15–20 μ broad; perithecial wall light brown, delicate, concentric fibrose, about 10 μ thick. Asci paraphysate, 8-spored, cylindrical, 50–60 × 7–11 μ. Spores obliquely monostichous or incompletely distichous, continuous, hyaline, ovate or ellipsoid-ovate, broadly rounded at both ends, 7–10 × 5–6 μ.

On *Leptocarydion Vulpiastrum* Stapf, on leaves, Sydenham, Natal, *Franks*, 7814.

On GRAMINEAE: Tribe ERAGROSTEAE.

**Phyllachora Eragrostidis** Doidge nov. spec.

Stromata sine maculis, interdum decolorationc flavo-brunnea circumdata, sparsa vel in greges laxos, minuta, opace atra, leniter convexa, oblonga v. striiformia plerumque 0·25–0·75 mm. longa, confluendo etiam majora, in utraque folii pagina vel superne tantum clypeo atro vel atro-brunneo, 20–30 μ crasso, indistincte parenchymatico subcarbonaceo praedita. Perithecia raro singularia, plerumque complura, ellipsoidea v. subglobosa, 150–300 μ diam., 150–180 μ alta, ostiolo plano, papilliformi poro ca. 12–15 μ lato aperto, clypeo omnino immerso praedita; pariete perithecii pallide brunneo, concentrice fibroso, 7·5–10 μ crasso. Asci 8-spori, cylindracei, apice rotundati, breviter stipitati, 80–90 × 10–12·5 μ. Sporae oblique monostichae, ovato-ellipsoideae, antice late rotundatae, postice vix vel parum attenuatae, 12–15 × 6–7·5 μ. Paraphyses paucae, fibrosae.

Hab. in foliis *Eragrostidis curvulae*, Mamathes, Basutoland, leg. Hean, 32428.

Not on leaf spots, but sometimes causing an indistinct, yellowish brown discoloration of the leaf tissues in the neighbourhood of the stromata. Stromata scattered or more or less grouped, minute, dull black, slightly convex, oblong to linear, mostly ¼–¾ mm. long, occasionally confluent and forming striae up to 1·5 mm. long.

Clypeus usually well developed on either side of the leaf, occasionally poorly developed or wanting in the lower epidermis, black, opaque, or olive brown, indistinctly parenchymatous, 20–30 μ thick; stroma in the mesophyll rather inconspicuous, composed of fine, hyaline hyphae which penetrate into the cells of the host at the margin of the stroma.

Perithecia solitary or several in each stroma, ellipsoid to subglobose, 150–300 μ diam., 150–180 μ high, occasionally lenticular, ca. 350 μ diam. and 140 μ high, usually occupying the whole thickness of the leaf; ostiole flat, papilliform, completely immersed in the

clypeus, periphysate, with a circular pore 12–15 μ broad; perithecial wall pale, delicate, concentric fibrose, 7·5–10 μ thick, merging above and below with the clypeus. Asci paraphysate, cylindrical, 8-spored, broadly rounded above, briefly stipitate, 80–90 × 10–12·5 μ. Spores obliquely monostichous, continuous, hyaline, ovate-ellipsoid, broadly rounded above, often tapering somewhat to the lower end, 12–15 × 6–7·5 μ. Paraphyses rather sparse, fibrose. Conidia present in the same stromata, hyaline, filiform, more or less curved.

On *Eragrostis curvula* Nees, on leaves, Mamathes, Basutoland, *Hean*, 32428, Type.

*Eragrostis gangetica* Steud., Donkerpoort, near Pretoria, *Doidge and Bottomley*, 30077.

*Eragrostis Lehmanniana* Nees, Toowoomba, Warmbaths, 30437.

*Eragrostis* spp., Irene, *S. Smuts*, 17014; Jacksonstuin, Brits District, *K. M. Putterill*, 32444.

**Phyllachora superba** Doidge nov. spec.

Stromata subdense et late dispersa, nonnunquam bina vel complura aggregata et plus minus connata, sine maculis, decolorationibus angustis rufo-brunneolis indefinitis cincta, elliptica v. fusiformia, 1–2 mm. longa et usque ad 1 mm. lata, opace astra; clypeo in utraque folii pagina evoluto, carbonaceo, ca. 10–20 μ crasso, fere opace atro-brunneo, indistincte et minute parenchymatico praedita; stromate in mesophyllo bene evoluto, pellucide olivaceo-brunneo, inter perithecia verticaliter prosenchymatico ex hyphis 2·5–4 μ crassis composito, cetero parenchymatico cellulis 2·5–5 μ diam. Perithecia pauca, raro unica vel numerosa, plus minusve dense stipata, subglobosa v. ovata, 80–250 μ diam., usque ad 250 μ in stromatis centro alta, marginalia minora ca. 150 μ alta; ostiola plano, papilliformi, clypeo omnini immerso, poro rotundato ca. 30 μ lato aperto praedita; pariete perithecii olivaceo-brunneo, e stratis pluribus cellularum indistinctarum composito; asci paraphysati, 8-spori, cylindracei, breviter pedicellati, 100–112·5 × 7·5–10 μ; sporae oblique monostichae, continuae, hyalinae, ellipsoideae, utrinque rotundatae, 11·5–15 × 5·5–7 μ. Paraphyses numerosae, filiformes, 1–1·5 μ crassae.

Hab. in foliis *Eragrostidis superbae*, Schagen, leg. Liebenberg, 29864.

Stromata conspicuous, visible on both sides on the leaf, not on leaf spots, but usually causing a reddish brown discoloration of the leaf tissues in the immediate vicinity, scattered, occasionally sub-seriate or very numerous and becoming confluent, elliptic to fusiform or irregular in outline, 1–2 mm. long and up to 1 mm. broad, dull black, more or less convex.

The leaf, which is normally 100–120 μ thick, becomes greatly distended, up to 250 or 280 μ thick, in the region of the stromata. Clypeus brown, usually dense in the epidermis on either side of the leaf, indistinctly and minutely parenchymatous, but not sharply differentiated from the well developed stroma in the mesophyll; this is mostly prosenchymatous near the perithecia, consisting of olive brown parallel hyphae 2·5–4 μ thick, elsewhere closely parenchymatous formed of cells 2·5–5 μ diam., becoming paler at the edges of the stroma, where subhyaline hyphae extend into the leaf tissue beyond the clypeus.

Perithecia few, occasionally solitary, or numerous in each stroma, flattened globose to ovate, often flattened laterally by mutual pressure, 80–250 μ diam., up to 250 μ high in the centre of the stroma and 150 μ high at the margin, with base resting on the upper epidermis. Ostiole flat, broadly papillate, completely immersed in the clypeus, periphysate, with a pore ca. 30 μ broad. Perithecial wall olive brown, concentric fibrose, but not clearly defined outwardly from the stroma. Asci paraphysate, 8-spored, cylindrical, rounded at the apex, briefly pedicellate, 100–112·5 × 7·5–10 μ. Spores obliquely monostichous, continuous, hyaline, ellipsoid, rounded at both ends, 11·5–15 × 5·5–7 μ. Paraphyses plentiful, hyaline, filiform, 1–1·5 μ thick.

On *Eragrostis superba* Peyr., on leaves, Schagen, *Liebenberg*, 29864, Type; Pelindaba, *Doidge and Bottomley*, 29846, 29872; Nelspruit, *Liebenberg*, 26018.

On GRAMINEAE: Tribe FESTUCEAE.

**Phyllachora ?Brachypodii** Roum.

Rev. Myc. 1885, p. 170; Theiss. and Syd., Ann. Myc. 13 (1915) p. 445.

Not on definite leaf spots; there is some yellowish brown discoloration of the leaf tissues around the stromata and affected leaves early become brown and dry. Stromata amphigenous, scattered or loosely grouped, usually discrete, rarely becoming confluent, small, black, somewhat shining, convex, elliptic to linear, 0·3–1·3 mm. long, visible on both sides of the leaf.

Clypeus in both upper and lower epidermis, dense, dark olive brown to black, more or less opaque, 15–25 μ thick, indistinctly parenchymatous. Stroma in mesophyll not extensive, poorly developed, consisting of loosely reticulate, hyaline hyphae ca. 1·5 μ thick.

Perithecia 2–7 in each stroma, lenticular, ellipsoid or subglobose, closely crowded, sometimes angular or irregular through mutual pressure, occupying the whole thickness of the leaf, 100–300 μ diam., 50–150 μ high; ostiole flat, papilliform, completely immersed in the clypeus, with a round pore ca. 15 μ broad. Perithecial wall concentric fibrose, delicate, 10–12 μ thick, pale olive brown, common wall between two perithecia usually firmer and darker, consisting of rather delicate hyphae 1–1·5 μ thick. Asci 8-spored, cylindrical, 62·5–80 × 10–11 μ. Spores obliquely monostichous, broadly ellipsoid to ovate, hyaline, continuous, broadly rounded at both ends, 8–11 × 5–6·5 μ.

On *Brachypodium flexum* Nees, Xumeni Forest, near Donnybrook, *Morgan and Doidge*, 29824, 31020, 32223, 32772.

The identity of this fungus with *Phyllachora Brachypodii* Roum. is uncertain, as no specimen of the European species on *Brachypodium pinnatum* was available for comparison.

On GRAMINEAE: Tribe PANICEAE.

**Phyllachora striatula** Theiss. et Syd.

Ann. Myc. 13 (1915) pp. 441–442.

Not on leaf spots; leaf tissues surrounding the stromata become discoloured and affected leaves early become yellowish or reddish brown. Stromata amphigenous, scattered or seriate, striiform, 0·5–1 mm. long, 0·1–0·2 mm. broad, at times only punctiform, dull black, convex; sometimes numerous and becoming confluent.

Clypeus on one side only, in the epidermis and the subepidermal cell over the perithecia, blackish brown to dense black, opaque, ca. 20 μ thick over the apex of the perithecia, up to 40 μ thick between the perithecia, indistinctly parenchymatous. Stroma in the mesophyll inconspicuous, poorly developed, consisting of more or less reticulate, hyaline hyphae, ca. 1·5 μ thick.

Perithecia one or few, rarely more than 3, in each stroma, deeply immersed, ellipsoid to lenticular or subglobose, 150–300 μ diam., 100–150 μ high; ostiole flat, papilliform, completely immersed in the clypeus. Perithecial wall light to dark olive brown, concentric fibrose, 10–15 μ thick, formed of fine hyphae 1–1·5 μ thick. Asci basal and lateral, 8-spored, cylindrical clavate, 70–100 × 10–15 μ. Spores monostichous to incompletely distichous, ellipsoid, continuous, hyaline, obtuse at both ends, 11–14 × 7–8 μ. Paraphyses numerous.

Pycnidia similar to the perithecia. Conidia filiform, hyaline, slightly curved, 25–40 μ long and ca. 1 μ broad.

On *Alloteropsis semialata* Hitch. (= *Axonopus semialatus*) Carolina, *Burtt Davy*, 483, Type; Garstfontein, *Bosman*, 29863; Hopevale, near Donnybrook, *Doidge*, 32282.

**Phyllachora sanguinolenta** Theiss. et Syd.

Ann. Myc. 15 (1917) p. 455.

Stromata not on leaf spots, amphigenous, very closely set on both sides of the leaf, black, somewhat shining, convex, round or elliptic, 0·3–1 mm. long, 0·3–0·5 mm. broad, occasionally becoming confluent and forming larger, compound stromata.

Clypeus usually only on one side of the leaf, above the perithecia, blackish brown to black, opaque, 20–25 μ thick, less frequently up to 45 μ thick; sometimes evident in the epidermis below the perithecia, but then comparatively poorly developed. Stroma in the mesophyll sparse, consisting of rather loosely reticulate hyphae 1·5–3 μ thick, light brown between the perithecia, elsewhere hyaline.

Perithecia few or numerous in each stroma, deeply immersed; sometimes stromata develop opposite to one another on either side of the leaf, and the perithecia are apparently biseriate with a clypeus on either side. Perithecia often rather closely crowded, globose to ellipsoid or somewhat angular through mutual lateral pressure, 150–300 μ diam., 120–150 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, with a pore ca. 20 μ broad. Perithecial wall well differentiated, light or darker olive brown, concentric fibrose, 8–10 μ thick, composed of rather delicate hyphae 1·5–2 μ thick. Asci cylindrical, rounded above, briefly pedicellate, 60–75 × 10–14 μ. Spores transversely or obliquely monostichous, occasionally incompletely distichous, hyaline, continuous, ellipsoid, rounded at both ends, 10–14 × 7–8 μ. Paraphyses numerous, filiform.

On *Brachiaria brizantha* Stapf, on leaves, Tzaneen, *Doidge*, 20352; Barberton, *Wager*, 26150.

*Brachiaria serrata* Stapf, Debbe's Ravine, Pretoria District, *Bosman*, 31007.

*Urochloa helopus* Stapf, Irene, *S. Smuts*, 17015; Barberton, *Mogg*, 7806.
*Urochloa mosambicensis* (Hack.) Dandy, Mazoe, S. Rhodesia, *Eyles* 3403.

**Phyllachora sanguinolenta** Th. et Syd. var. **microspora** Th. et Syd. Ann. Myc. 13 (1915) p. 455; Doidge, Bothalia I (1924) p. 221.

Stromata thickly scattered, elliptic, convex, slightly shining, black, 0·5–1 mm. long. Spores smaller than the type, 7·5–9 × 5–6 μ.

On *Panicum Stapfianum* Fauve (= *Panicum minus* Stapf), Bloemfontein, *Potts*, 11307. *Urochloa ?pullulans* Stapf, Toowoomba, Warrabaths, 30436.

**Phyllachora Digitariae** Syd. Bothalia I (1924) p. 220.

Not on leaf spots, but causing more or less brown discoloration of the leaf tissues around the stromata. Stromata scattered, black, only slightly shining, slightly convex elliptic, 0·3–1 mm. long, rarely becoming confluent and forming larger compound stromata.

Clypeus on both sides of the leaf, usually well developed, blackish brown, opaque, 15–30 μ thick; less frequently, especially in the upper epidermis, not closely compact, consisting of loosely or more closely interwoven, tortuous, olive brown hyphae, 2·5 μ thick, which do not always completely fill the epidermal cells. Stroma in the mesophyll sparse.

Perithecia 1–5 in each stroma, deeply immersed; sometimes stromata develop opposite to one another on either side of the leaf and the perithecia are then apparently irregularly distichous. Perithecia ellipsoid or subglobose, or, when closely crowded, often angular through mutual lateral pressure, 100–250 μ diam., 100–180 μ high; ostiole flat, papilliform, immersed in the clypeus, copiously periphysate, with a round pore 15–20 μ broad. Perithecial wall light golden brown, concentric fibrose, 10–15 μ thick, composed of rather delicate hyphae, 1·5–2 μ thick. Asci cylindrical, briefly stipitate, 50–65 × 9–14 μ. Spores monostichous or imperfectly distichous, continuous, hyaline, broadly ellipsoid to subglobose, 8–10 × 7–8 μ. Paraphyses numerous, hyaline.

On *Digitaria Smutsii* Stent, on leaves, Irene, Pretoria District, *S. Smuts*, 17017, Type.
*Digitaria eriantha* Steud., Donkerpoort, Pretoria District. *Doidge and Bottomley*, 29768.
*Digitaria eriantha* Steud. var. *stolonifera* Stapf, Primhof, Pretoria, *Bottomley*, 23876.
*Digitaria Pentzii* Stent, Ashbury, *Doidge and Bottomley*, 29782.
*Digitaria seriata* Stapf, Donkerpoort, *Doidge and Bottomley*, 29770.

**Phyllachora digitaricola** Doidge nov. spec.

Stromata sine macula, amphigena, subinde contraria, sparsa, v. complura aggregata plus minus connata, atra, convexula, haud vel vix nitidula, elliptica v. striiformia, usque 1 mm. longa, in utraque folii pagina vel unica tantum clypeo opace atro brunnea, 20–30 μ crasso praedita. Perithecia plerumque 1–3, rarius usque 5, plus minusve seriatim deposita, ellipsoidea, subglobosa v. irregularia, 180–350 μ diam., 110–230 μ alta, ostiolo plano, papilliformi, clypeo omnino immerso, poro ca. 15 μ lato aperto praedita; pariete perithecii 10–20 μ crasso, concentrice fibroso. Asci numerosi, cylindracei v. cylindraceo-clavati, antice rotundati, postice plus minusve attenuati, breviter stipitati, 8-spori, 60–90 × 12–15 μ. Sporae obliquae monostichae v. subdistichae, continuae, hyalinae, ellipsoideae, utrinque rotundatae, 12–15 × 6–7·5 μ. Paraphyses numerosae, fibrosae, mox mucosae.

Hab. in foliis *Digitariae Bra...ae*, Donkerpoort, prope Pretoria, leg. Doidge et Bottomely, 29776.

Stromata amphigenous, not on leaf spots, sometimes developing opposite to one another at the same point on the leaf, scattered, subserrate or in irregular groups. Individual stromata small, dull black or somewhat shining, convex, elliptic to striiform, up to 1 mm. long, often confluent in irregular groups or forming striae up to 5 mm. long.

Clypeus well developed in the epidermis over the perithecia, blackish brown, opaque, 20–30 μ thick, formed of closely interwoven hypae which are 2·2·5 μ thick, at first pale, becoming dark olive brown, opaque; clypeus absent from the opposite epidermis, or, if present, less extensive and not so well developed. Stroma in the mesophyll sparse, formed of loosely reticulate, hyaline hyphae.

Perithecia usually 1–3 in each stroma, rarely more than 5, developing between the epiderma and the subepidermal layers of cells, or more deeply seated and sometimes reaching the opposite epidermis, monostichous, or when two stromata develop opposite to one another apparently distichous, ellipsoid or subglobose, sometimes irregular in shape, 180–350 μ diam., 110–230 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, with a pore ca. 15 μ broad. Perithecial wall firm, pale olive brown to dark brown,

concentric fibrose, composed of pale or darker olive brown hyphae 1·5–2 μ thick. Asci 8-spored, cylindrical or cylindrical-clavate, briefly stipitate, 60–90 × 12–15 μ. Spores obliquely monostichous or imperfectly distichous, hyaline, continuous, ellipsoid, rounded at both ends, 12–15 × 6–7·5 μ. Paraphyses numerous, fibrose, breaking down early.

On *Digitaria Brazzae* Stapf, on leaves, Donkerpoort, *Doidge and Bottomley*, 29776, Type.
*Digitaria longiflora* Pers., Durban, *McClean*, 30093.
*Digitaria monodactyla* Stapf, Rietvlei, Pretoria District, *Acocks and Murray*, 32139.
*Digitaria sanguinalis* Scop., Westfalia, Northern Transvaal, *Doidge*, 20329.

**Phyllachora melinicola** Syd.

Ann. Myc. 22 (1924) p. 429.

Stromata amphigenous, not on leaf spots nor on discoloured parts of the leaf, scattered, discrete, elliptic or elliptic-oblong, 0·5–1 mm. long, dull black, slightly convex.

Clypeus formed on both sides of the leaf, dark brown to black, opaque, 20–35 μ thick, indistinctly parenchymatous, or plectenchymatous formed from dark olive brown, tortuously interwoven hyphae, 2·5–4 μ thick. Stroma around and between the perithecia plectenchymatous, consisting of loosely or closely reticulate, pale to dark olive brown hyphae ca. 1·5 μ thick; stroma in the mesophyll hyaline, poorly developed.

Perithecia usually 1–3 in each stroma, often developing between the epidermis and the subepidermal layer of cells, but sometimes deeply immersed in the mesophyll and reaching the opposite epidermis, variable in form, usually ellipsoid, globose or irregular, 300–400 μ diam., 175–300 μ high; sometimes lenticular and up to 650 μ diam.; ostiole flat, papilliform, immersed in the clypeus, with a round pore ca. 10 μ broad. Perithecial wall very distinct, firm, yellowish brown to olive brown, 10–20 μ thick, concentric fibrose, composed of hyphae 1·5–2 μ thick. Asci cylindrical or cylindrical-clavate, stipitate, 8-spored, 50–70 × 14–20 μ. Spores transversely or obliquely monostichous or incompletely distichous, hyaline, continuous, ellipsoid, rounded at both ends, 11–14 × 8–9 μ. Paraphyses numerous, fibrose.

On *Melinis minutiflora* Beauv. var. *mutica*, Tzaneen, *van der Byl* 1652, 20446 (ex-Herb. Sydow) Type.
*Melinis tenuinervis* Stapf, Nelspruit, *Liebenberg*, 26037.
*Melinis* sp., Salisbury, *Eyles*, 15515.

**Phyllachora heterospora** P. Henn.

apud de Wildeman, Mission E. Laurent, Fasc. IV (1907) p. 362. Syll. Fung. XXII, p. 425. Theissen and Sydow, Ann. Myc. 13 (1915) p. 453. Doidge, Bothalia I (1922) p. 68.

Not on leaf spots, but causing some discoloration of the leaf tissues in the immediate vicinity of the stromata and badly affected leaves soon become brown and dry. Stromata amphigenous, sometimes distributed more or less evenly over the leaf surface, but typically in elliptic to linear groups, 5–20 mm. long and 1–2·5 mm. broad; these groups are often numerous and sometimes become confluent end to end. Single stromata usually discrete, round to elliptic, black, somewhat shining, convex, 0·3–1 mm. long and ca. 0·3 mm. broad.

Clypeus on both sides of the leaf or on only one side, usually dense, brownish black, opaque, 15–30 μ thick, indistinctly parenchymatous; sometimes, especially in the epidermis below the perithecia, less dense, composed of more or less closely reticulate, pale to dark olive brown, tortuous hyphae, 1·5–2·5 μ thick, which do not always completely fill the epidermal cells. Stroma in mesopyhll not extensive, consisting of hyaline hyphae 1·5–2·5 μ thick; between the perithecia and at the margin of the stroma the hyphae are pale olive brown, and more or less closely reticulate.

Perithecia occasionally solitary, but usually 4–10 in each stroma, developing between the epidermis and the subepidermal layers of cells or more deeply seated and often reaching the opposite epidermis; not infrequently stromata develop opposite to one another on either side of the leaf. Perithecia crowded, ellipsoid, subglobose or irregular, 180–300 μ, rarely up to 360 μ diam., 100–160 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, with a more or less round pore 10–15 μ broad. Perithecial wall firm, concentric fibrose, composed of pale or darker olive brown hyphae, 1–1·5 μ thick. Asci 8-spored, cylindrical, 60–80 × 10–16 μ. Spores usually distichous, continuous, hyaline, ellipsoid, tapering somewhat to rounded ends, 13–17 × 7–8 μ. Paraphyses numerous, hyaline, filiform.

Conidia present in the same stromata, hyaline, filiform, curved, ca. 15–20 μ long and 0·5 μ thick.

On *Panicum maximum* Jacq., on leaves, Somerset East, *MacOwan 1319*, 20823; Natal, *Medley Wood 221*; Maritzburg, *Pole Evans*, 1442; Durban, *Doidge*, 1611 and *Wager*, 32720; Barberton, *Doidge*, 2015 and *van der Byl*, 5137; Umbelusi, Mozambique, *Howard*, 664; Nelspruit, *Liebenberg*, 26007; Mozambique, *Howard*, 1459; Tzaneen, *Doidge*, 20321 and *van der Byl 1493*; Kentani, *Pegler*, 1773, 9095; Cedara, *Staples*, 17058 and *van der Byl 1113*; Buffelspoort, Rustenburg District, *Jacot-Guillarmod*, 30651; Derdepoort, Pretoria District, *Doidge and Bottomley*, 29803; Umtentweni, Natal, *Porter*, 32678.

*Panicum deustum* Thunb., Umfolosi, Empangeni District, Natal, *McClean*, 31018; Ndwedwe, Natal, *Halse*, 30296; Amanzimtoti, *Doidge*, 30121, Hippo Pool, Pretorius Kop, Kruger National Park, *Chippindall*, 33148.

This fungus was originally described from leaves of *Panicum maximum*, collected in the Congo. It was, however, recorded from South Africa by Kalchbrenner as early as 1882, under the name *Dothidea graminis* Pers. (Grev. X, p. 146); the two collections mentioned are those of MacOwan (No. 1319) and Medley Wood (No. 221), portions of both these collections are to be found in the Pretoria herbarium and are undoubtedly *Phyllachora heterospora*. This species appears to be very common in South Africa and to occur wherever the host is found.

*Cryptodidymosphaeria clandestina* Syd. occurs as a parasite in the stromata of the Phyllachora in the following numbers: 1442, 1611, 17058. Another fungus, *Comothyrium occultum* Syd. (Ann. Myc. 35, 1937, p. 281) was described from No. 26096; this is also parasitic in the stromata of *Ph. heterospora*.

**Phyllachora Winkleri** Syd.

Ann. Myc. 10 (1912) p. 80; Theiss. and Syd., Ann. Myc. 13 (1915) p. 456; Doidge, Bothalia I (1924) p. 220.

Stromata conspicuous on both sides of the leaf, scattered, sometimes numerous and becoming confluent, dull black, often with a rough surface, convex, elliptic or oblong, 0·5–3 mm. long and up to 0·5 mm. broad.

Clypeus well developed in the epidermis on both sides of the leaf, 20–25 $\mu$ thick, dark brown, subopaque to opaque black, composed of closely interwoven brown hyphae, 3–5 $\mu$ thick. Stroma in the mesophyll poorly developed, consisting of loosely reticulate, hyaline or subhyaline hyphae.

Perithecia fairly numerous in each stroma, not closely crowded, usually lying between the upper epidermis and the fibro-vascular bundles, occasionally occupying almost the whole thickness of the leaf. Perithecia ellipsoid to subglobose, 200–250 $\mu$ diam., 120–250 $\mu$ high; ostiole flat, papilliform, completely immersed in the clypeus, with a round pore 15–20 $\mu$ broad. Perithecial wall well differentiated, light olive brown, concentric fibrose, composed of rather delicate hyphae ca. 1·5 $\mu$ thick. Asci 8-spored, cylindrical, briefly pedicellate, 80–120 × 11–16 $\mu$. Spores monostichous, continuous, hyaline, broadly ellipsoid, 14–17 × 9–12 $\mu$. Paraphyses numerous, hyaline.

Conidia sometimes present, hyaline, filiform, curved.

On *Paspalum scrobiculatum* L., on leaves, Quelimane, Mozambique, *Howard*, 643; Nelspruit, *Liebenberg*, 25998, 26062; Ndwedwe, Natal, Halse, 30291.

In the type, collected in tropical Africa, the perithecia are described as being 340 $\mu$ diam. and 180–200 $\mu$ high, sometimes extended in the direction of the axis of the leaf to 700 $\mu$ long. Perithecia in the South African specimens examined did not exceed the measurements given above.

**Phyllachora Penniseti** Syd.

Ann. Myc. 13 (1915) p. 39; Theiss. and Syd., Ann. Myc. 13 (1915) p. 457; Doidge, Bothalia I (1922) p. 68.

Not on leaf spots and causing very little localised discoloration of the leaf tissues, but when stromata are numerous, the leaves early become brown and dry. Stromata conspicuous on both sides of the leaf, scattered or in groups and more or less serriate, round or oblong, 0·5–4 mm. long, or becoming confluent and forming larger, compound stromata, dense black, slightly convex.

Clypeus usually well developed on either side of the leaf, occasionally wanting or poorly developed in the epidermis below the perithecia, black, opaque, 20–45 $\mu$ thick, obscurely parenchymatous. Between the perithecia, the stroma is plectenchymatous, composed of olive brown hyphae 1·5–3 $\mu$ thick, usually more or less reticulate, but in places tending to become parallel and loosely prosenchymatous.

Perithecia rather large, one to many in a single stroma, often occupying the whole thickness of the leaf, lenticular to irregular or angular-globose, 280–350 μ diam. or up to 650 μ long, 200–300 μ high; ostiole flat, papilliform, copiously periphysate, completely immersed in the clypeus, with a pore 20–25 μ broad. Perithecial wall light brown, concentric fibrose, 7–10 μ thick, formed of delicate hyphae 2–3 μ thick. Asci 8-spored, clavate, rounded at the apex, 70–95 × 20–26 μ. Spores distichous or obliquely monostichous, broadly ellipsoid, continuous, hyaline, broadly rounded at both ends, 17–24 × 11–18 μ. Paraphyses very numerous, fibrose, ca. 1·5 μ thick.

Conidia filiform, continuous, hyaline, straight or flexuous, 18–35 × 1 μ.

On *Pennisetum macrourum* Trin., on leaves, Hogsback, *K. M. Putterill*, 30071; Kirstenbosch, *Pearson*, 7401; Stellenbosch, *van der Byl 1921, 2316*.

*Pennisetum sphacelatum* D. et S., Tugela Valley, near Mont-aux-Sources, Natal, *Doidge*, 14102.

The type specimen of *Phyllachora Penniseti* Syd., on *Pennisetum Benthami* Steud., was collected by Vanderyst in the Congo. Dr. Sydow has a specimen on *Pennisetum purpureum* from Uganda collected by Hansford and one collected by Deighton in Sierra Leone. There is also, in the Pretoria Herbarium, a specimen on *Pennisetum setosum* collected by Dümmer in Uganda.

**Phyllachora Evansii** Syd.

Ann. Myc. 10 (1912) p. 40; Theissen and Sydow, Ann. Myc. 13 (1915) p. 459; Doidge, Bothalia I (1922) p. 67.

Stromata on definite, light brown leaf spots with a darker brown edge, or not on definite leaf spots but causing some discoloration of the leaf tissues. Stromata smooth, dull black, scattered, in series or in groups, sometimes becoming confluent, visible on both sides of the leaf, but more conspicuous and more convex on the upper side, oblong, 0·5–1 mm. long, 0·3–0·5 mm. broad.

Clypeus usually on both sides of the leaf, but not so well developed nor so extensive and occasionally wanting on the lower side, occupying the epidermal cells and often extending to subepidermal cell layers, formed of closely interwoven brown hyphae, 2–3 μ thick, becoming opaque, very dense black, 20–40 μ thick, occasionally up to 50 μ. Stroma around the perithecia composed of loosely reticulate hyphae, hyaline or pale olive brown, occasionally tending to become vertical and in parallel strands, but not typically prosenchymatous; sparse and poorly developed in the mesophyll.

Perithecia one or few in each stroma, usually occupying the whole thickness of the leaf, ellipsoid to lenticular or irregular in form, 250–500 μ diam., 120–200 μ high; ostiole flat, papilliform, periphysate, completely immersed in the clypeus. Perithecial wall concentric fibrose, 12–15 μ thick, composed of light brown hyphae 1·5–2 μ thick. Asci 8-spored, cylindrical to cylindrical-clavate, rounded at the apex, 70–120 × 7–12 μ. Spores momostichous to incompletely distichous, hyaline, continuous, ellipsoid to oblong, usually rounded at both ends, but sometimes somewhat drawn out at the lower end, straight, 14–18 × 6–8 μ. Paraphyses hyaline, filiform, very numerous.

Pycnidia often present in the same stromata; conidia hyaline, filiform, curved in various ways, often falcate, 15–25 × 1 μ.

On *Setaria sulcata* Raddi (= *S. Chevalieri* Stapf), Barberton, *Burtt Davy*, 137, 138, Type and *Pole Evans*, 1280; Isipingo, *Bottomley*, 11659; Woodbush, Northern Transvaal, *Doidge*, 17734 and *van der Byl 1654*; Durban, *Bottomley*, 12231; Schagen, *Liebenberg*, 26025; Umtentweni, Natal, *Wager*, 32672; Umfolosi, *McClean*, 32307.

*Setaria lindenbergiana* Stapf, Wonderboom, near Pretoria, *Mogg*, 23464.

**Phyllachora transvaalensis** Doidge nov. spec.

Stromata amphigena, subinde contraria, in pagina folii opposita non vel parum visibilia, decolorationibus angustis, flavo-brunneolis indefinitis cincta, elliptica usque linearia 1–2 mm. longa, ca. 0·5 mm. lata, subinde confluendo longiora, atra, nitidula, convexula. Clypeo in una epidermide plerumque tantum evoluto, in altera deficiente vel tantum parcissime formato, atro, opaca, carbonaceo, usque 50 μ crasso; stromate inter perithecia ex hyphis 1·5–2 μ crassis laxe reticulato-contexto, in mesophyllo parce evoluto. Perithecia 1 vel plura in quoque stromate, quoad formam et magnitudinem ludentia, sive numerosa, et aggregata, ellipsoidea usque subglobosa aut irregularia, pariete communi separata, usque ad 200 μ alta et 100–330 μ lata; sive solitaria et distanter posita, ellipsoidea, 120–200 μ alta et 270–420 μ lata; ostiolo plano papilliformi, clypeo omnino immerso, periphysato

praedita ; pariete perithecii olivaceo-brunneo usque obscure brunneo, plerumque 10–15 μ crasso, concentrice fibroso. Asci copiose paraphysati, 8-spori, cylindracei vel clavati, 62–75 × 11–16 μ. Sporae recte vel oblique monostichae, in ascis clavatis subinde subdistichae, continuae, hyalinae, subglobosae usque late ellipsoideae, 10–12·5 × 7·5–9 μ.

Hab. in foliis *Setariae flabellatae*, Donkerpoort, prope Pretoria, leg., Doidge et Bottomley, 30090.

Not on definite leaf spots, but stromata surrounded by a yellowish brown zone of discoloured leaf tissue. Stromata amphigenous, sometimes at the same point on the leaf ; not visible on the opposite side of the leaf or only faintly so, convex, black, shining, scattered or in groups, elliptic to linear, 1–2 mm. long and about 0·5 mm. broad ; occasionally coalescent and forming longer striae.

Clypeus usually well developed, in one epidermis only, black, opaque, carbonaceous, up to 50 μ thick, indistinctly parenchymatous ; absent from the opposite epidermis or very poorly developed. Between the perithecia and between the clypeus and the subepidermal cells at the edges of the stroma, is a mass of loosely reticulate hyphae, which are hyaline to pale olivaceous brown and 1·5–2 μ thick ; stroma in the mesophyll poorly developed, consisting of a few hyaline hyphae. Perithecia developing between the epidermis and the subepidermal layers of the leaf, one to many in each stroma, irregular in form and size ; when numerous and crowded, ellipsoid to subglobose or irregular, 100–350 μ diam., up to 200 μ high in the centre of the stroma and 120 μ high at the margin ; when single or widely separated, ellipsoid, 270–420 μ diam., and 120–200 μ high ; ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a more or less round pore 20–25 μ broad. Perithecial wall well defined, olive brown to dark brown, mostly 10–15 μ thick, usually, paler and less clearly defined at the base, where it presses against the cellls of the host concentric fibrose, formed of hyphae 1·5–2 μ thick. Asci 8-spored, cylindrical to clavate, 62–75 × 11–16 μ. Spores monostichous in the cylindrical asci or incompletely distichous in the clavate asci, hyaline, continuous, subglobose to broadly ellipsoid, 10–12·5 × 7·5–9 μ. Paraphyses numerous, hyaline, fibrose.

Pycnidia often present in the same stromata and interspersed with the perithecia. Conidia filiform, hyaline, straight or somewhat curved, 20–40 × 1–1·5 μ.

On *Setaria flabellata* Stapf, Donkerpoort, near Pretoria, *Doidge and Bottomley*, 30090 ; Birchleigh, *Hean*, 30091 ; Rietvlei, Pretoria District, *Acocks and Murray*, 32138. *Setaria nigrirostris* Dur. et Schinz, Vereeniging, *Burtt Davy*, 10021. *Setaria sphacelata* Stapf et Hubb., Garstfontein, Pretoria District, Pienaar, 1265 ; Barberton, *Doidge*, 2012 ; Donkerpoort, *Doidge and Bottomley*, 30092.

This fungus differs from *Phyllachora Evansii* Syd. and *Ph. setariaecola* Speg., which also occur on *Setaria* spp. The subglobose ascospores are rather characteristic. The material on *Setaria nigrirostris* and *S. sphacelata* is scanty and rather poor, but is evidently the same species as the one on *S. flabellata*.

**Phyllachora Tricholaenae** P. Henn.

Engl. bot. Jahrb. XXIII (1897) p. 541 ; Theiss. and Syd., Ann. Myc. 13 (1915) p. 461.

Not on definite leaf spots, but causing more or less purplish brown or yellowish brown discoloration of the leaf tissues around the stromata. Stromata amphigenous, small, shining black, convex, oblong or elliptic, 0·5–1 mm. long, scattered or in small groups or series and often coalescing to form longer striae up to 5 mm. long ; visible, but not so conspicuous, on the opposite side of the leaf, which, in the region of the stromata, becomes distended to about twice its normal thickness.

Clypeus well developed in the epidermis over the perithecia, brownish black to black, opaque, up to 25 μ thick, composed of olive brown, closely interwoven hyphae ca. 2·5 μ thick ; in the opposite epidermis not so well developed and less extensive, sometimes reduced to a few small black spots, with some orange red discoloration in the adjacent cells of the host. When the perithecia are not contiguous, the space between them is filled with stroma, consisting of loosely or more closely reticulate, light or dark olive brown hyphae, 1·5–3 μ thick ; this is sometimes compact and almost opaque, especially near the clypeus. Stroma elsewhere in the mesophyll poorly developed, consisting of a few hyaline hyphae.

Perithecia up to 7 in each stroma, occupying the whole of the mesophyll between the upper and lower clypeus, or not quite reaching the lower epidermis, globose, flattened globose or irregular, 120–280 μ diam., 100–200 μ high ; ostiole flat, papilliform, completely

immersed in the clypeus. Perithecial wall usually pale yellowish brown, 8–15 μ thick, concentric fibrose, consisting of delicate, yellowish or pale olive brown hyphae 2–2.5 μ thick; occasionally, especially the common wall between perithecia, firmer, darker brown and up to 25 μ thick. Asci paraphysate, 8-spored, cylindrical or cylindrical-clavate, briefly stipitate, 67–82·5 × 12–14 μ. Spores obliquely monostichous or distichous, continuous, hyaline, ellipsoid, broadly rounded at both ends, 11–15 × 5·5–6·5 μ.

Conidia often present, hyaline, filiform, straight or somewhat curved, continuous, 20–36 μ long, 0·5–0·7 μ broad.

On *Rhynchelytrum repens* (Willd.) Hubb. (= *Tricholaena rosea* Nees), on leaves and sheaths, Godwan River, *Liebenberg*, 26053; Nelspruit, *Liebenberg*, 26672; Irene, *S. Smuts*, 17013; Winkle Spruit, *Pole Evans*, 5641; Ashbury, *Doidge and Bottomley*, 29781; Donkerpoort, Pretoria District, *Doidge and Bottomley*, 29738; Schagen, *Liebenberg*, 30139; Tzaneen, *van der Byl 1657*; Durban, *van der Byl*, 32454; Cavendish, Natal, *Wager*, 32784.

*Tricholaena monachne* Trin., Beira, *Hitchcock 31381*, 33107; Derdepoort, Pretoria District, *Doidge and Bottomley*, 29796.

In the South African material, the spores are narrower than the measurements given in the original description. The South African specimens were compared by Dr. Sydow with the type, collected on *Tricholaena rosea* in Usambara, and he could find no difference. The tropical fungus is more luxuriantly developed and the stromata are usually more distant in the South African specimens; in *van der Byl 1657*, collected at Tzaneen, however, there is the same luxuriant development as in the type. *Cryptodidymosphaeria clandestina* Syd., was observed parasitic in the stroma of No. 29738.

On GRAMINEAE: Tribe SPOROBOLEAE.

**Phyllachora Morganae** Doidge nov. spec.

Stromata sine maculis, decolorationibus angustis brunneolis indefinitis cincta, plerumque epiphylla, in pagina contraria plus minus visibilia, opace atra, convexa, elliptica, usque ad 1·5 mm. longa; clypeo bene evoluto, opace atra, carbonaceo, mox 35–58 μ crasso, mox 20 μ crasso, in epidermide opposito minus extenso et parce evoluto. Perithecia in quoque stromate pauce vel numerosa, ellipsoidea vel globosa, pressione saepe irregularia, in parte centrali stromatis 180–200 μ alta et 100–300 μ diam., ad marginem stromatis ellipsoidea usque 320 μ diam. et 100 μ alta; ostiolo plano, papilliformi, omnino immerso praedita; pariete peritheci ca 10–15 μ crasso, brunneo, concentrice fibroso; asci 8-spori, cylindracei vel clavati, saepe supra pedicellum abrupte geniculati, 68–100 × 13–16 μ, pedicello mox brevi mox plus minus elongato; sporae monostichae vel distichae, ellipsoideae, utrinque, rotundatae v. subacutae, saepe etiam superne rotundatae, inferne subacutae, 15–17·5 × 7–10 μ. Conidia simul praesentia gracillima, continua, filiformia, 15–23 μ longa, ca. 0·5 μ tantum crassa.

Hab. in folus *Sporoboli pyramidalis*, in silvis, Xumeni, prope Donnybrook, leg. **Morgan** et Doidge, 29833.

Stromata mostly epiphyllous, but more or less visible on the opposite side of the leaf, not on leaf spots, but surrounded by a narrow zone of yellow brown, discoloured leaf tissue, dull black, convex, scattered, elliptic, up to 1·5 mm. long, or more or less seriate and becoming confluent in lines up to 5 mm. long.

Clypeus in the epidermis over the perithecia black, opaque, carbonaceous, sometimes well developed, 35–58 μ thick, sometimes only 20 μ thick; on the opposite side of the leaf less extensive and comparatively poorly developed, sometimes lacking. Stroma between and around the perithecia composed of pale olive brown hyphae 1–2 μ thick, which are loosely reticulate or become vertical and form parallel strands, not closely prosenchymatous; elsewhere in the mesophyll stroma development is sparse.

Perithecia deeply immersed, few or many in each stroma, ellipsoid to subglobose or irregular through mutual pressure, 180–200 μ high in the centre of the stroma, 100–300 μ diam.; at the margin of the stroma ellipsoid, up to 320 μ diam. and ca. 100 μ high; ostiole flat, papilliform, completely immersed in the stroma, with a pore ca. 20 μ broad. Perithecial wall well defined at the sides, brown, firm, concentric fibrose, ca. 10–15 μ thick; at the base, where it presses against the cells of the host, thinner, ca. 7–8 μ, or fused with the lower clypeus. Asci 8-spored, cylindrical to clavate, often bent abruptly just above the stipe, which may be short or prolonged, 68–100 × 13–16 μ. Spores monostichous to distichous, hyaline, continuous, rounded or subacute at the ends, often rounded above and subacute below, 15–17·5 × 7–10 μ.

On *Sporobolus pyramidalis* Beauv., on leaves, Xumeni Forest, near Donnybrook, *Morgan and Doidge*, 29833; Nottingham Road, *McClean*, 32292.

*Sporobolus* sp., Donkerpoort, Pretoria District. *Doidge and Bottomley*, 29772.

So far as can be judged from the descriptions, this fungus differs from *Phyllachora Sporoboli* Pat. from Algiers and from *Ph. sporobolicola* Petr. et Cif. collected in Santiago. There has been no opportunity of examining authentic material of either species.

On GRAMINEAE: Tribe ZOYSIAE.

**Phyllachora Perotidis** Doidge nov. spec.

Stromata plerumque sine maculis typicis sed decolorations brunneae cincta, in utraque folii pagina visibilia, in epiphyllo plerumque magis conspicua et leniter convexula, subcircularia vel elliptica aut irregularia, usque ad 0·5 mm. longa, sparsa vel gregea minutos formantia; clypeo atro, opaco, in epiphyllo usque 30 $\mu$ crasso, in hypophyllo minus evoluto usque 15 $\mu$ crasso praedita; perithecia 1-5 in quoque stromate, subglobosa vel ellipsoidea, 120-450 $\mu$ diam., 150-200 $\mu$ alta, ostiolo papilliformi, poro ca. 15 $\mu$ lato aperto, clypeo omnino immerso praedita; pariete peritheci ca. 10 $\mu$ crasso, pallide brunneo, concentrice fibroso; asci 8-spori, cylindracei, 60-70 × 10-11·5 $\mu$; sporae obliquae v. fere transverse monostichae, hyalinae, continuae, ellipsoideae, 10-12·5 × 5-7 $\mu$. Paraphyses numerosae, fibrosae.

Hab. in foliis *Perotidis indicae*, Donkerpoort, prope Pretoria, leg. Doidge et Bottomely, 29754.

Stromata occasionally on oval, light brown leaf spots with a darker brown margin, but more frequently surrounded by an indefinite brown zone of discoloured tissue, mostly epiphyllous, usually visible on both sides of the leaf, but more conspicuous and slightly convex on the upper surface, dull black, scattered or in small groups, subcircular to elliptic or irregular in outline and up to 0·5 mm. long.

Clypeus well developed in the upper epidermis, black, opaque, up to 30 $\mu$ thick, usually not extending beyond the perithecia, formed of tortuous, olive brown, closely interwoven hyphae, 1·5-2·5 $\mu$ thick, becoming parenchymatous; less extensive and up to 15 $\mu$ thick, or lacking in the lower epidermis. Stroma in the mesophyll inconspicuous and not extensive, consisting of a few hyaline hyphae. Leaf tissues in the vicinity of young stromata are apparently unaffected, but when the perithecia have discharged their spores, the cells of the leaf under the clypeus become brown and dead and often opaque.

Perithecia one or several, up to 5 in each stroma, developing under the epidermis or more deeply seated and often reaching the lower epidermis, subglobose to ellipsoid, 120-150 $\mu$ diam., 150-200 $\mu$ high; ostiole flat, papillate, completely immersed in the clypeus, with a pore ca. 15 $\mu$ broad. Perithecial wall pale, concentric fibrose, not well defined, ca. 10 $\mu$ thick, consisting of delicate hyphae 1·5-2·5 $\mu$ thick, outer layers pale olive brown, inner hyaline. Asci 8-spored, cylindrical, 60-70 × 10-11·5 $\mu$. Spores obliquely or almost transversely monostichous, hyaline continuous, ellipsoid, 10-12·5 × 5-7 $\mu$. Paraphyses numerous, fibrose, hyaline. Pycnidia often present in the same stromata, conidia filiform hyaline.

On *Perotis indica* (L.) O. Ktze., on leaves, Donkerpoort, Pretoria District, *Doidge and Bottomley*, 29754; Pretoria Kop, Kruger National Park, *Chippindall*, 33147.

On MUSACEAE.

**Phyllachora Strelitziae** Sacc. emend. Doidge.

Syll. Fung. 2 (1883) p. 606.

*Dothidea Strelitziae* Cke., Grevillea X (1882) p. 129.

*Endodothella Strelitziae* (Cke.) Theiss. et Syd., Ann. Myc. 13 (1915) p. 327. Doidge, Bothalia I (1921) p. 31.

Young stromata not on leaf spots, nor causing discoloration of the tissue of the host, older stromata are usually to be found singly or in groups of 2-3, on very definite leaf spots 3-10 mm. long, at first brown, then becoming paler in the centre with a reddish brown border; these spots are visible also on the under side of the leaf.

Stromata epiphyllous, scattered or rather closely crowded and then becoming confluent, round to elliptic in outline, 0·5-2·5 mm. long and 0·5-1 mm. broad, conical, dull black except at the apex, which is shining black around the single, punctiform ostiole, sometimes visible also on the under side of the leaf, where they show as minute, flat or slightly convex, purplish brown to black spots.

Clypeus massive, occupying the upper epidermis and several subepidermal layers of more or less rectangular cells devoid of chlorophyll, opaque, black, carbonaceous, usually 75–80 μ thick, sometimes up to 100 μ thick, microparenchymatous in structure, formed of rather thick-walled, dark olive brown, irregular cells, 4–6 μ diam. Stroma round the perithecia is light brown to purplish brown, prosenchymatous, formed of vertical, thin-walled hyphae, mostly 4–6 μ thick and filling the space between the arched clypeus and the mesophyll of the leaf. Stroma poorly developed in the mesophyll, consisting of hyaline hyphae, more or less closely reticulate and interwoven; often extending to the lower epidermis where a clypeus is formed, shorter than on the upper side, comparatively poorly developed and often not continuous; sometimes there is some sterile prosenchymatous stroma under this lower clypeus, to a depth of 50 μ.

The large, solitary perithecium is usually seated on the palisade cells of the leaf and is covered by the arched clypeus; it is lenticular, 550–850 μ diam., 200–300 μ high; ostiole flat, completely immersed in the clypeus, opening by a broadly funnel-shaped pore, ca. 25 μ broad at the base and 50 μ at the apex, periphyses rather sparse. Perithecial wall well defined, ca. 10 μ thick at the base, where it is closely appressed to the cells of the leaf, 15–20 μ thick at the sides, merging above with the clypeus, concentric fibrose, composed of rather delicate, thin-walled hyphae 2·5–3 μ thick, outer layers olive brown, inner hyaline. Asci 8-spored, cylindrical, rounded above, tapering below to a short foot, 130–165 × 20–30 μ. Spores monostichous or incompletely distichous, hyaline, continuous, globose to broadly ellipsoid, 9–16 × 10–12·5 μ; apparently remote from one another in the ascus, each spore being surrounded by a mucilaginous sheath 4–4·5 μ thick. Paraphyses numerous, filamentous, exceeding the asci, less than 1 μ thick.

On *Strelitzia augusta* Thunb., on leaves, Inanda, *Medley Wood 580*, 9468, 10442; Isipingo, *Doidge*, 6639, and *Wager*, 32423; Scottsburgh, *Pole Evans*, 6831; Inanda, *van der Byl*, 6958; Kentani, *Pegler 2384*, 9422; Durban, *van der Byl 498*, 32448; Amanzimtoti, *Curson*, 30774.

This fungus has been redescribed from No. 30774, material in excellent condition collected by Dr. Curson at Amanzimtoti. In most of the other collections the perithecia are old, but typical Phyllachora spores have been found in several of them; a few Phyllachora asci were even found clinging to the walls of old perithecia in Medley Wood's original collection. The two-celled spores described by Theissen and Sydow (l.c.) and also observed by Doidge (l.c.) are probably those of a parasite invading old perithecial cavities.

On MORACEAE.

**Phyllachora amaniensis** P. Henn.

Engl. bot. Jahrb. 38 (1905) p. 113; Theiss. and Syd., Ann. Myc. 13 (1915) p. 473; Doidge, Bothalia I (1921) p. 29.

Stromata not on definite leaf spots, but causing some brown discoloration of the leaf tissues in the immediate vicinity, hypophyllous, sometimes faintly visible also on the upper leaf surface, almost always discrete and often rather remote from one another, but usually more or less grouped; the groups are often large and irregular in outline, up to about 3 cm. long and 2 cm. broad, not infrequently on both sides of one of the larger veins which forms the longitudinal axis of the group. Single stromata slightly raised, dull black, round and up to 1 mm. diam., or irregular in outline and up to 2 × 1 mm.

Stromata deeply and completely immersed in the substratum; clypeus on the lower side of the leaf epidermal, dark olive brown to black, opaque, 25–40 μ thick, obscurely parenchymatous; occasionally there are traces of clypeus formation in the upper epidermis. Stroma in the mesophyll well developed, the cells of the host being permeated by fine, hyaline or pale olive brown, more or less recticulate hyphae.

Perithecia numerous, deeply immersed, rather closely crowded, flattened-globose, 200–300 μ diam. (250–380 μ fide Theissen and Sydow l.c.). Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a pore ca. 20 μ broad. Perithecial wall 10–15 μ thick, concentric fibrose, composed of fine hyphae 1–1·5 μ thick, outer layers pale or darker brown, inner layers hyaline. Asci cylindrical, copiously paraphysate, 8-spored, 90–130 × 9–11 μ. Spores monostichous, continuous, hyaline, ellipsoid, broadly rounded at both ends, 12–16 × 7·5–8·5 μ.

On *Ficus capensis* Thunb., on leaves, Amanzimtoti, *Franks*, 7812; Barberton, *van der Byl*, 7378; Wyebank, *Doidge*, 9537; Umhlali, *Bosman*, 29924; Schagen, *Liebenberg*, 26005.

This species was originally described by Hennings (l.c.) on Ficus sp., Amani, Usambara, in Tanganyika Territory, tropical Africa.

**Phyllachora ficuum** Niessl.

Hedwigia 20 (1881) p. 99; Syd. Ann. Myc. 7 (1909) p. 546.

*Trabutia ficuum* (Niessl.) Theiss. et Syd., Ann. Myc. 13 (1915) p. 352; Doidge, Bothalia I (1921) p. 24.

Not on leaf spots, but causing some indeterminate, yellowish brown discoloration of the leaf tissues. Stromata amphigenous but mostly epiphyllous, scattered or closely set and becoming confluent in small groups, small, 0·5–1 mm. diam., round to irregular in outline; often flat at the margin and convex in the centre over the perithecia, black, shining, especially round the punctiform ostioles.

Stroma between the perithecia light brown to purplish brown, prosenchymatous, composed of vertical, parallel hyphae 5–8 $\mu$ thick; covered by a rather massive clypeus, which is black, opaque, 30–35 $\mu$ thick. Stroma in the mesophyll poorly developed, but the epidermal cells below the perithecia are permeated by a network of fine hyphae and become disintegrated and golden brown.

Perithecia few in each stroma, with their base on the changed epidermal cells of the host, flattened globose to ellipsoid or lenticular, 220–420 $\mu$ diam., 115–200 $\mu$ high. Ostiole flat papilliform, completely immersed in the clypeus, periphysate, with a pore about 20 $\mu$ broad. Perithecial wall pale, concentric fibrose, not very well developed, 10–12 $\mu$ thick. Asci 8-spored, cylindrical-clavate, broadly rounded above, narrowed below into a short stalk, sp. part 55–75 × 14–18 $\mu$. Spores obliquely monostichous to imperfectly distichous, hyaline, continuous, ovate or broadly ellipsoid, rounded at both ends, 11–14 × 6·5–9 $\mu$. Paraphyses hyaline, fibrose.

On *Ficus sycomorus* L., on leaves, Mozambique, *Howard*, 520; Lourenco Marques, *Howard*, 719; Nelspruit, *Liebenberg*, 25969; near Salisbury, *Verdoorn*, 33202.

This fungus was originally described on *Ficus infectoria* collected in Calcutta. One of the collections made by Howard was identified by Sydow (l.c.) as this species; the number is not quoted. The host of the South African collections was wrongly identified (Doidge l.c.); it is *Ficus sycomorus*, not *F. howardiana*.

**Phyllachora grammica** P. Henn.

Flore du Bas et Moyen Congo. Ann. Mus. du Congo 2 (1907) p. 98.

*Catacauma grammicum* (P. Henn.) Theiss. et Syd., Ann. Myc. 13 (1915) p. 382; Doidge, Bothalia I (1921) p. 26.

Not on definite leaf spots but causing an indeterminate yellowish brown discoloration of the leaf tissues. Stromata scattered, amphigenous, usually only on one side of the leaf, but sometimes opposite one another on the upper and lower surface; following the veins and forming dull black, slightly raised lines or streaks up to 7 mm. long and 0·8 mm. broad, often dendritic and confluent, thus tending to form a loose network.

Stroma between the perithecia prosenchymatous, formed of vertical, parallel, purplish brown hyphae 6–8 $\mu$ thick; covered by a clypeus which at first develops in the arched epidermis; clypeus opaque, black or blackish brown, variable in thickness, 30–60 $\mu$, rather obscurely parenchymatous. Stroma in the mesophyll sparse.

Perithecia few in each stroma, with base pressing against the subepidermal cells of the leaf, broadly ellipsoid, 300–350 $\mu$ diam., 140–180 $\mu$ high. Ostiole flat, papilliform, completely immersed in the clypeus. Perithecial wall 10–15 $\mu$ thick, often thinner at the base, concentric fibrose, consisting of delicate, pale purplish brown hyphae. Asci cylindrical, 8-spored, 45–58 × 7–10 $\mu$. Spores monostichous, continuous, hyaline, ellipsoid, rounded at both ends, 8–10 × 4–5·5 $\mu$. Paraphyses hyaline, fibrose, breaking down early.

On *Ficus capensis* Thunb., on leaves, Lemana, Northern Transvaal, *Doidge*, 1829; Kentani, *Pegler 1993*, 8884; Storm's River, Humansdorp District, *Doidge*, 17164.

The type specimen was collected by Vanderyst at Kisantu, Congo. No. 1829, quoted above was identified as this species by Theissen and Sydow (l.c.).

**Phyllachora Howardiana** Petr.

Ann. Myc. 27 (1929) p. 386.

*Trabutia Evansii* Theiss. et Syd. (not *Phyllachora Evansii* Syd.) Ann. Myc. 13 (1915) p. 352; Doidge, Bothalia I (1921) p. 24.

Not on definite leaf spots but causing some yellowish brown or reddish brown discoloration of the leaf tissues; on *Ficus capensis* old stromata are often surrounded by a narrow zone of white. Stromata small, black, convex, round, up to 1 mm. diam., more or

less regularly arranged in groups 5 mm. to 1 cm. diam., 10–50 stromata or more in each group, often closely crowded but not becoming completely fused with one another. Not infrequently the groups of stromata are numerous and become confluent, so that the small stromata are distributed more or less evenly over the whole leaf surface.

Clypeus arched, opaque black, massive, 50–80 $\mu$ thick; stroma between the perithecia prosenchymatous, composed of greyish brown, vertical parallel hyphae 4–5 $\mu$ thick. Stroma in the mesophyll poorly developed, but the epidermal cells are filled with a mass of fine hyphae and they become discoloured and broken down.

Perithecia 1–2 in each stroma, rarely more, flattened globose to lenticular, 250–550 $\mu$ diam., 150–250 $\mu$ high, with base resting on the changed epidermal cells of the leaf, ostiole flat, papilliform, completely immersed in the clypeus, periphysate. Perithecial wall light or dark brown, concentric fibrose, 15–18 $\mu$ thick. Asci cylindrical with monostichous spores or clavate with distichous or more or less conglobate spores, 70–90 × 10–16 $\mu$. Spores ellipsoid, broadly rounded at both ends, hyaline, continuous, 11–14 × 8–9·5 $\mu$. Paraphyses hyaline, fibrose, breaking down early and becoming unrecognisable.

On *Ficus carica* L., on leaves, Lourenco Marques, *Howard*, 668, Type.
*Ficus capensis* Thunb., Umhlali, *Bosman*, 29923.

**Phyllachora nervisequens** (Lingelsh.) Petr.
Ann. Myc. 27 (1929) p. 386.
*Phyllachora Schweinfurthii* P. Henn. var. *nervisequens* Lingelsh. Engl. bot. Jahrb. 39 (1907) p. 604.
*Trabutia nervisequens* (Lingelsh.) Theiss. et Syd., Ann. Myc. 13 (1915) p. 353; Doidge, Bothalia 1 (1920) p. 25.

Stromata usually epiphyllous, but occasionally developing also on the under side of the leaf, not on typical leaf spots but almost always causing a yellowish brown or greenish yellow discoloration of the leaf tissues, visible also on the under side of the leaf. Stromata developing exclusively on the midrib and on the lateral veins, often broadly elliptic in outline, often angular and more or less irregular, elongated in the direction of the veins and coalescing more or less freely; small stromata may be only 1 mm. long, large compound stromata up to 1 cm. long (2 cm. in the type). Stromata black, somewhat shiny, superficial, uneven in thickness, sterile parts of the stroma less raised and with a wrinkled surface; elsewhere the surface is indistinctly mammulose through the slightly prominent perithecia, the punctiform ostioles being surrounded by a slightly depressed ring. Stroma between the perithecia purplish brown, parenchymatous, composed of vertical, parallel hyphae 7–9 $\mu$ thick covered by a rather massive, opaque black clypeus, uneven in thickness, 50–90 $\mu$, most frequently ca. 75 $\mu$ thick. Stroma in the mesophyll sparse, consisting of a few hyaline hyphae.

Perithecia few or many in each stroma, close together or rather remote from one another, with base resting on the epidermal cells of the leaf, flattened globose, 200–400 $\mu$ diam., or lenticular, 400–600 $\mu$ diam., 200–300 $\mu$ high. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a more or less round pore. Perithecial wall well developed, 12–18 $\mu$ thick, concentric fibrose, composed of rather delicate brown hyphae 2–2·5 $\mu$ thick. Asci cylindrical, rounded above, narrowed below into a short stalk, 8 spored, 75–110 × 11–14 $\mu$. Spores usually monostichous, broadly ellipsoid, continuous, hyaline, 12–16 × 8–10 $\mu$. Paraphyses hyaline, fibrose, breaking down early.

On *Ficus Burtt Davyi* Hutch., on leaves, Umgeni Lagoon, Durban, *Doidge*, 854; Port Shepstone, *Pole Evans*, 5608; Amanzimtoti, *Franks*, 7813.
*Ficus natalensis* Hochst., Malvern, Natal, *Doidge*, 1994; Winkle Spruit, *Pole Evans*, 2019; Port Elizabeth, *D. Gunn*, 12248; Escombe, *Henn*, 33109.
*Ficus Burkei* Miq., Eastern Transvaal, *Liebenberg*, 32884.

Number 12248 was described (Bothalia l.c.) as var *robusta* of *Trabutia nervisequens*; the fungi of this group are variable in stroma development and the separation of this collection as a distinct variety is not justifiable. The species was originally described on *Ficus Hochstetteri* var *glabrior* collected in Abyssinia. The South African specimens have comparatively small stromata and are not so extensively developed on the veins, otherwise they resemble the type.

**Phyllachora Pretoriae** Doidge nov. spec.

Stromata sine maculis, amphigena, subinde sparsa plerumque autem seriatim venas evoluta et confluendo greges longos dendriticos v. irregulares formantia, minuta, usque 0·5 mm. diam., atra, convexa, inter cuticulam et epidermidem formata, stromate inter

perithecia bene evoluto, vertcaliter prosenchymatico ex hyphis olivaceo brunneis, 5–6 $\mu$ crassis composito, clypeo atro, opaco, 25–35 $\mu$ crasso. Perithecia 1 usque pauca in quoque stromate, depresso globosa v. elliptica, 250–350 $\mu$ diam., 130–200 $\mu$ alta, ostiolo plano, papilliformi, clypeo omnino immerso praedita; pariete perithecii brunneo, 5–15 $\mu$ crasso, concentrice fibroso, indistincte cellulose. Asci paraphysati, 8-spori, cylindraceo clavati, mox diffluentes, p. sp. ut videtur, 70–75 × 15 $\mu$. Sporae distichae, hyalinae, continuae, ellipsoideae, raro subglobosae, utrinque rotundatae, 15–17·5 × 7–9 $\mu$, raro usque 20 $\mu$ longae et 10 $\mu$ latae.

Hab. in foliis *Fici Pretoriae*, Rustenburg, leg. Kreisfelder, 23675.

Not on leaf spots and rarely causing any definite discoloration of the leaf tissues. Stromata amphigenous, sometimes scattered, but usually developing in rows along the veins, often coalescing in long lines or irregular groups, frequently dendritic. Single stromata minute, round to irregular in outline, up to 0·5 m. diam., convex, dull black, shining around the punctiform ostiole.

Superficial stroma around or between the perithecia prosenchymatous, olive brown, composed of vertical parallel hyphae 5–6 $\mu$ thick; outer layers forming a clypeus 25–35 $\mu$ thick, blackish brown to black, opaque, obscurely parenchymatous, the epidermal cells of the host beneath the perithecia are filled with fine, pale brown or subhyaline hyphae, some of which extend into the mesophyll.

Perithecia usually single in each individual stroma, occasionally 2–3, with base resting on the epidermal cells of the leaf, flattened globose or ellipsoid, 250–350 $\mu$ diam., 130–200 $\mu$ high; ostiole flat, papilliform, completely immersed in the clypeus, with a pore 10–12 $\mu$ broad, periphyses sparse; perithecial wall dark brown, firm, subopaque, concentric fibrose and indistinctly cellular, 5–10 $\mu$ thick at the base, ca. 15 $\mu$ thick at the sides, merging above the clypeus. Asci 8-spored, cylindrical clavate, breaking down early, so far as could be observed, sp. part. 70–75 × 15 $\mu$. Spores distichous, hyaline, continuous, ellipsoid, rarely subglobose, rounded at both ends, 15–17·5 × 7–9 $\mu$, rarely up to 20 $\mu$ long and 10 $\mu$ broad. Paraphyses breaking down early and becoming unrecognisable.

On *Ficus Pretoriae* Burtt-Davy, Rustenburg, *Kreisfelder*, 23675.

**Phyllachora repens** (Corda) Sacc.

Syll. Fung. 2 (1883) p. 597; Lorrain Smith, Cat. of Welwitsch's African Plants 2 (1901) p. 477.

*Sphaeria repens* Corda, Icon. Fung. IV, p. 42, tab. IX, f. 123 (1840).

*Isothea rhytismoides* Fr., Welw. and Curr. in Trans. Linn. Soc. 26 (1870) p. 285.

*Dothidea repens* Berk., Hook. Jour. Bot. (1851) p. 331; Kalchbrenner, Grev. X (1882) p. 145; Cooke, Grev. VIII (1879) p. 72 and X (1881) p. 27.

*Catacauma repens* (Corda) Theiss. et Syd., Ann. Myc. 13 (1915) p. 383.

This species was described by Corda from leaves of *Ficus religiosa* collected in India.

Two collections on *Ficus ingens* Miq., made by Medley Wood at Inanda in Natal (*Medley Wood 228*, 9466 and *Medley Wood 513*, 10135) were assigned to this species by Kalchbrenner and Cooke (loc. cit.). Portions of these collections are to be found in the Pretoria Herbarium but unfortunately both are in poor condition; *Medley Wood 228* may possibly be *Phyllachora graminea* P. Henn., *Medley Wood 513* differs very considerably in habit, stroma and form and size of perithecia, but the latter appear to be immature and neither asci nor spores are present. Further collections of Phyllachora on this host are necessary.

*Phyllachora repens* has also been recorded from Africa by Lorrain Smith (l. c.) on leaves of *Ficus trachyphylla* Fenzl, in woods at Monino, Huilla, *Welwitsch 111* and near Lopollo, Huilla, *Welwitsch 6371*. There has been no opportunity of examining these specimens.

On PROTEACEAE.

**Phyllachora Protea** Wakef.

Kew Bull. (1922) p. 164.

Stromata epiphyllous, scattered, minute, 200–300 $\mu$ diam., round, discrete, very rarely becoming confluent, flat at the periphery, raised and more or less convex in the centre, dull black.

Stromata formed under the stromata of the leaf, clypeus covered by the thick cuticle, epidermal, 20–30 $\mu$ thick, limited in extent, not extending beyond the perithecium or barely so, opaque, black, formed of dark olive brown, parenchymatus cells ca. 5 $\mu$ diam.; the clypeus is continuous with a zone, 30–50 $\mu$ deep, of opaque, black or dark olive brown

stromatic tissue, surrounding the single perithecium, similar in structure to the clypeus, parenchymatous, but formed of somewhat larger, round to angular cells, ca. 7–8 μ diam. Elsewhere the stroma consists of light or dark brown, branching hyphae, 2·5–3 μ thick, which penetrate to some distance between the cells of the mesophyll.

Perithecium solitary, immersed in the mesophyll, globose or flattened globose, 180–200 μ diam., 150–180 μ high; ostiole flat, papilliform, completely immersed in the clypeus; perithecial wall pale, concentric fibrose, not sharply differentiated outwardly from the stroma. Asci copiously paraphysate, cylindrical, briefly stipitate, 120–150 × 12–15 μ. Spores obliquely monostichous, ovate, tapering somewhat to rounded ends, continuous hyaline, 19–20 × 8–9 μ. Paraphyses branched, filiform, exceeding the asci.

On *Protea mellifera* Thunb., on leaves, Klapmuts, *van der Byl 357*, 32915.

I am indebted to Miss Wakefield for a small portion of the type specimen. The stroma of this fungus differs from that of most *Phyllachora* spp.; among the South African species, it rather closely resembles that of *Ph. superba* on *Eragrostis superba*.

On LEGUMINOSAE.

**Phyllachora Halsei** Doidge nov. spec.

Stromata amphigena, plerumque epiphylla, sine maculis, decoloratione flavo-brunnea circumdata, in pagina contraria vix vel parce visibilia, sparsa vel pauca aggregata, atra, nitida, fortiter convexa, subinde etiam petiolicola; clypeo solum in epidermide supra perithecia evoluto, ultra haud vel vix extenso, atro-brunneo, parenchymatico, 25–37·5 μ crasso. Perithecia plerumque solitaria in quoque stromate, depresso-globosa, 230–300 μ diam., 140–240 μ alta, profunde immersa; ostiolo plano, papilliform, periphysato, clypeo omnino immerso, poro rotundato ca. 10 μ lato aperto praedita; pariete perithecii pallide vel flavidulo-brunneo, 8–10 μ crasso, concentrice fibroso. Asci 8-spori, clavati usque fusiformes, 100–110 × 15–17·5 μ. Sporae distichae, anguste ellipsoideae, utrinque leniter attenuatae sed obtusae, hyalinae, continuae, 15–18 × 5–5·5 μ. Paraphyses numerosae, filiformes.

Hab. in foliis *Acaciae Gerrardi*, Verulam, Natal, leg. Halse, 30128.

Not on definite leaf spots, but causing some yellowish brown discoloration of the tissues of the host which is faintly visible on the opposite side of the leaf. Stromata amphigenous, mostly epiphyllous, scattered or in small groups, minute, more or less circular in outline, 0·25–0·5 mm. diam., black, shining, strongly convex.

Clypeus only in one epidermis, limited in extent, not extending beyond the perithecium or extending only about 50 μ beyond it, blackish brown, opaque, obscurely parenchymatous, 25–37·5 μ thick. Stroma in the mesophyll sparse and poorly developed.

Perithecia usually solitary in each stroma, deeply immersed, flattened globose, 230–300 μ diam., 140–240 μ high; ostiole flat, papilliform, completely immersed in the clypeus, with fine hyaline periphyses and a pore ca 10 μ broad. Perithecial wall delicate, pale to yellowish brown, 8–10 μ thick, concentric fibrose. Asci 8-spored, often cylindrical at first with obliquely monostichous spores; mature asci clavate to fusiform, 100–110 × 15–17·5 μ, with incompletely distichous spores, more or less rounded above, narrowed somewhat at the base into a stalk which may be short or up to 20 μ long. Spores narrow ellipsoid, tapering slightly but definitely to rounded ends, hyaline, continuous, 15–18 × 5–5·5 μ, Paraphyses numerous, hyaline, exceeding the asci.

On *Acacia Gerrardi* Benth., on leaves and petioles, Verulam, *Halse*, 30128, Type; Nelspruit, *Doidge*, 32405.
*Acacia Benthami* Roxbr., Scottsburgh, Natal, *Halse*, 30380.
*Acacia robusta* Burch., Umzinto, Natal, *McClean*, 30116.

This fungus is near *Phyllachora Acaciae* P. Henn. (Ann. Myc. 13, 1915, p. 488), on *Acacia Farnesiana* from Ecuador and *A. amentacea* from Mexico, but in the American species there is a clypeus both above and below the perithecia and hence it is conspicuous on both sides of the leaf. It also seems to differ from *Phyllachora sudanensis* Petr. (Ann. Myc. 29, 1931, p. 357) which has larger perithecia and ellipsoid spores which do not taper to the ends or taper very slightly. No specimen of the latter species on *Acacia verrucosa* from the Sudan has been seen.

In the collection on *Acacia Benthami* cited above, the spores are slightly smaller, up to 12·5 × 5 μ and more broadly rounded at the ends; the asci are also smaller, up to 100 × 17·5 μ; this material is possibly not quite mature.

**Phyllachora rikatliensis** (Doidge) Petr.

Ann. Myc. 25 (1927) pp. 291–293.

*Phyllachorella rikatliensis* Doidge, Bothalia I (1921) p. 30.

Stromata amphigenous, in small groups; the groups are round to irregular and up to 5 mm. diam., sometimes numerous, becoming confluent and covering the greater part of the leaf surface. Single stromata usually discrete, rarely close together and becoming fused, round, elliptic or bluntly angular, 300–500 μ diam., smooth, black, shining, slightly convex.

Clypeus on both sides of the leaf, developing in the epidermis and in the mesophyll, usually 25 μ thick at the margin, up to 50 μ in the centre, black, opaque, obscurely parenchymatous, extending beyond the perithecia to a distance of 80 μ over the mesophyll. The mesophyll of the leaf between the two clypeus plates is almost entirely broken down and discoloured and is permeated by olive brown or blackish brown stroma tissue.

Perithecia deeply immersed, usually solitary, sometimes 2 or more are closely crowded under one clypeus, very variable in form and size, often irregular, seldom lenticular or globose, 180–350 μ diam., 120–200 μ high; perithecial wall usually 10–20 μ thick, concentric fibrose, indistinctly cellular. Asci clavate or cylindrical-clavate, sometimes fusiform, broadly rounded above, tapering somewhat towards the base, which is sessile or has a short, knob-like foot, thin-walled, 8-spored, 50–60 × 10–15 μ. Spores usually more or less completely distichous, occasionally monostichous, oblong, broadly rounded at both ends, continuous, hyaline, 10–13 μ long, rarely up to 15 μ, 4–5 μ broad, with epispore ca. 0·5 μ thick. Paraphyses rather sparse, broadly filamentous, ca. 2–4 μ broad, very thin-walled, early becoming mucilaginous and unrecognisable.

On *Andradia arborea* Sim, Rikatli, Mozambique, *Junod*, 11726.

Petrak points out that the conidial form observed (Doidge l.c.) can only be regarded as a parasite of the Phyllachora. He has described it fully (l.c.) under the name *Microdiplodia rikatliensis* Petr.

**Phyllachora Brachystegiae** Doidge.

Bothalia I (1924) p. 220.

Not on leaf spots. Stromata epiphyllous but often visible also on the lower side of the leaf, scattered, often developing on either side of the midrib of the leaf or on the lateral veins, circular or broadly elliptic, black, somewhat shini g, convex, mostly 0·4–0·6 mm. diam.

Clypeus in both upper and lower epidermis, extending for some distance beyond the perithecia over the mesophyll, brownish black, opaque, ca. 25–30 μ thick, obscurely parenchymatous. Stroma in the mesophyll consists of fine, hyaline hyphae permeating the tissues; as the stromata become old, the leaf tissue between the upper and lower clypeus becomes discoloured and dead.

Perithecia usually solitary, rarely 2 are found under one clypeus, flattened globose, 250–400 μ diam., 240–300 μ high, deeply immersed and reaching the lower clypeus; ostiole flat, papilliform, completely immersed in the clypeus. Perithecial wall delicate, concentric fibrose, indistinctly cellular, not sharply defined, outer layers light brown, ca. 10 μ thick, inner layers delicate, hyaline. Asci 8-spored, cylindrical or cylindrical-clavate, rounded above, tapering more or less towards the base, 75–120 × 13–16 μ. Spores obliquely monostichous, less frequently incompletely distichous, ellipsoid to subclavate, broadly rounded above, usually tapering more or less to an obtuse or rounded base, 16–22·5 × 6–7·5 μ.

On *Brachystegia* sp., on leaves, Salisbury, *Eyles*, 11680, Type; Dombashana, *van der Byl 2443*.

*Brachystegia Randii* Bak. f., Salisbury, *Eyles 5023*, *5024*, *5025* (*van der Byl 2462*, *2460*, *2464*).

**Phyllachora puncta** (Cke.)Doidge nov. comb.

*Dothidea puncta* Cke., Grevillea X (1882) p. 128.

*Parodiella puncta* (Cke.) Sacc., Syll. Fung. I, p. 718.

*Catacauma punctum* (Cke.) Theiss. et Syd., Ann. Myc. 15 (1917) p. 141.

Not on leaf spots, but causing a vague, yellowish brown discoloration of the leaf tissues in the neighbourhood of the stromata. Stromata amphigenous, sometimes solitary, often several on one leaflet, black, shining, strongly convex, more or less circular, up to ca. 0·5 mm. diam., often developing in close proximity to one another and becoming completely fused, forming larger, compound stromata which are round to irregular up to ca. 1 mm. diam., or elongated along a vein.

Clypeus originating in the epidermis and becoming arched over the perithecia, blackish brown, opaque, 30–40 μ, or in places up to 60 μ thick, obscurely parenchymatous. Stroma between or around the perithecia often loosely parenchymatous under the clypeus, elsewhere indefinite in structure, brown to subhyaline; hyaline hyphae also extend into the mesophyll.

Perithecia usually solitary in individual stromata, compound stromata often with 2–5, or as many as 8 perithecia, subglobose to ellipsoid, with base resting on the subepidermal cells of the leaf, 150–350 μ diam., 150–300 μ high; ostiole flat, papilliform, completely immersed in the clypeus, periphysate. Perithecial wall light to dark olive brown, well developed, concentric fibrose, 10–15 μ thick, merging above with the clypeus. Asci numerous, 8-spored, sp. part ellipsoid to clavate, tapering somewhat to the rounded apex, attenuate at the base to a short foot or a longer stalk up to 20 μ long, less frequently cylindrical, 60–70 × 15–20 μ. Spores completely or incompletely distichous in the ellipsoid or clavate asci, obliquely monostichous in the cylindrical asci, ovate or broadly ellipsoid, broadly rounded at both ends, continuous, hyaline, 12–15 × 8–10 μ. Paraphyses hyaline, numerous, fibrose.

On *Dalbergia armata* E. Mey., on leaves, Inanda, *Medley Wood 605*, *607*, 9488, 10441; Barberton, *Pole Evans*, 588; Umgeni Lagoon, Durban, *Doidge*, 881; Stella Bush, Durban, *Doidge*, 1662; Verulam, *Pole Evans*, 6809; Schagen, *Liebenberg*, 29908, 29880; Amanzimtoti, *Doidge*, 30289; Umbogintwini, *Wager*, 32718.

Numbers 588, 1662 and 6809 cited above were described as *Catacauma dalbergiicola* (P. Henn.) Theiss. et Syd. (= *Phyllachora dalbergiicola* P. Henn.) in Bothalia I (1921) p. 25; this is a closely related species, and is perhaps only an American variety of *Phyllachora puncta*; in the American species the spores are narrower, 12–14 × 6–7 μ, than in the South African collections, and the perithecia are larger.

**Phyllachora Peltophori** Syd.

Ann. Myc. 10 (1912) p. 40; Theissen and Sydow, Ann. Myc. 13 (1915) p. 507; Doidge, Bothalia I (1921) p. 29.

Not on leaf spots, nor causing any marked discoloration of the leaf tissues. Stromata amphigenous, scattered or more or less grouped, not infrequently numerous and becoming confluent, minute, black, shining, convex, more or less circular, mostly 250–350 μ diam., rarely up to 500 μ.

Clypeus over the perithecia opaque black, 20–25 μ thick, extending only a short distance beyond the perithecia; similar in the opposite epidermis, or sometimes rather poorly developed.

Perithecia solitary, deeply immersed, globose or flattened globose, 180–300 μ diam., mostly 160–180 μ, sometimes up to 240 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, copiously periphysate, with a circular pore ca. 10 μ broad. Perithecial wall weak, poorly differentiated, hyaline, concentric fibrose. Asci 8-spored, ellipsoid to ellipsoid-clavate, less frequently cylindrical, rounded above, narrowed below into a short stalk, 65–80 × 13–19 μ. Spores distichous, continuous, hyaline, ellipsoid, rounded at both ends, 13–17 × 6–8 μ. Paraphyses numerous, fibrose.

On *Peltophorum africanum* Sond., Ledzee, Northern Transvaal, *Doidge*, 1810, Type; Nelspruit, *Loest*, 29888 and *Doidge* 32400.

**Phyllachora Pterocarpi** Syd.

Ann. Myc. 10 (1912) p. 40.

*Catacauma pterocarpi* Syd., Ann. Myc. 13 (1915) p. 387; Doidge, Bothalia I (1921) p. 25; Hopkins, Trans. Rhod. Sc. Ass. 35 (1938) p. 103.

Not on definite leaf spots, but tissues near the stromata are vaguely discoloured, often remaining dull green after the leaf has turned brown. Stromata epiphyllous, small, scattered, round to irregular in outline, 1–2 mm. diam., black, shining, convex, with uneven surface; at times isolated stromata become surrounded by a concentric ring of secondary stromata; often stromata are very numerous and closely set over the whole leaf surface.

Clypeus originating in the epidermis, becoming arched over the perithecia but extending on either side of them for some distance over the mesophyll of the leaf, blackish brown, opaque, variable in thickness, ca. 25 μ thick near the apex of the perithecium, elsewhere up to 50 μ thick. Stroma between the perithecia olive brown or greyish brown, loosely parenchymatous or indefinite in structure; from this hyaline hyphae extend into the cells of the leaf, permeating the mesophyll

Perithecia 1–9 in each stroma, with base pressing on the subepidermal cells of the leaf, globose or flattened globose, occasionally ellipsoid to lenticular, 350–450 μ diam., 240–300 μ high; ostiole flat, papillate, completely immersed in the clypeus, periphysate, with pore ca. 15 μ broad. Perithecial wall concentric fibrose; at the base, where it is closely applied to the cells of the host, usually golden brown, ca. 10 μ thick; lateral walls usually olive brown, ca. 15 μ thick, but not sharply defined outwardly and merging with the hyphae composing the stroma. Asci very numerous, lining the base and sides of the perithecia, 8-spored, sp. part ellipsoid, clavate or cylindrical-clavate, not tapering or tapering somewhat to the rounded apex, 60–80 × 16–24 μ, attenuated below into a short foot or a longer stalk 25–30 μ long. Spores more or less completely distichous or monostichous, hyaline, continuous, ellipsoid, but with the greatest diameter often somewhat above the centre, broadly rounded at both ends, 16–21 × 8–9 μ. Paraphyses numerous, hyaline, fibrose.

On *Pterocarpus angolensis* D.C., on leaves, Letaba Drift, Northern Transvaal, *Doidge*, 1807, Type; Barberton, *van der Byl*, 1922, 5132; Schagen, *Liebenberg*, 26354; Pretorius Kop, Kruger National Park, *Lansdell*, 29954.

*Pterocarpus erinaceus* Lam., Nelspruit, *Loest*, 29891; Salisbury, *Eyles* 5020 (*van der Byl 2461*); Mazoe, *van der Byl 2459*; Matopos, *Eyles 5019* (*van der Byl 2463*).

*Pterocarpus rotundifolius* (Sond.) Druce (= *Pt. sericeus* Benth.), Nelspruit, *Wager*, 23413, and *Doidge*, 32402; Schagen, *Liebenberg*, 26014; Khami Ruins, *van der Byl 204*; Tzaneen, *van der Byl 1502*.

*Pterocarpus* sp., Rhodesia, *van der Byl 65*.

**Phyllachora Schotiae** Doidge nov. comb.

*Catacauma Schotiae* Doidge, Bothalia I (1922) p. 65.

Not on leaf spots, nor causing any marked discoloration of the leaf tissues. Stromata epiphyllous, scattered, minute, black, convex, more or less circular or oval in outline, 0·3–0·4 μ diam.

Clypeus only in the upper epidermis, black, opaque, 30–40 μ thick, remaining covered by the thick cuticle which is 10–16 μ thick; the clypeus does not always completely cover the perithecium, being sometimes 100 μ less in diameter; sometimes it is rather poorly developed, not quite continuous nor completely filling the epidermal cells. Stroma plectenchymatous, consisting of a weft of fine, hyaline hyphae around the perithecia, which extends for some distance between the epidermis and the palisade cells; stroma in the mesophyll sparse and poorly developed.

Perithecia usually solitary, rarely two are found crowded together under one clypeus, ellipsoid to lenticular, 300–450 μ diam., 100–150 μ high, with base pressing against the subepidermal layer of cells, which becomes concave. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with pore 15–17 μ broad. Perithecial wall very pale, subhyaline, concentric fibrose, 12–16 μ thick. Asci paraphysate, 8-spored, oblong or ellipsoid, tapering somewhat to the rounded apex, sessile, 80–87 × 17–20 μ. Spores distichous, hyaline, continuous, ellipsoid-oblong, rounded at both ends, often more broadly rounded above and tapering somewhat downwards, sometimes slightly asymmetrical, 20–24 × 6–7 μ; immature spores seem to be surrounded by a mucilaginous envelope.

On *Schotia speciosa* Jacq., on leaves, Humewood, Port Elizabeth, *Doidge*, 2294.

**Phyllachora Tephrosiae** Syd.

Ann. Myc. 22 (1924) p. 430.

Not on leaf spots, nor causing any marked discoloration of the leaf tissues. Stromata epiphyllous, scattered over the whole leaf surface, more of less numerous, round or irregular in outline, sometimes becoming confluent, 0·5–1 mm. diam., rather strongly convex, black, shining.

Clypeus in the upper epidermis, dense black, opaque, 25–40 μ thick, and often extending for some distance beyond the perithecia, over the mesophyll; often present also in the lower epidermis, where it is not so well developed nor so extensive. Stroma in the mesophyll well developed between and around the perithecia under the clypeus, light olive brown, composed of hyphae 4–5 μ thick; elsewhere in the mesophyll usually sparse.

Perithecia several in each stroma, deeply immersed, globose or angular from mutual lateral pressure, 150–250 μ diam. Ostiole flat, papilliform, completely immersed in the clypeus, copiously periphysate, with a round pore ca. 15 μ broad. Perithecial wall light to dark olive brown, concentric fibrose, 15–20 μ thick. Asci cylindrical to clavate, briefly stipitate, 8-spored, 50–70 × 12–20 μ, copiously paraphysate. Spores monostichous,

distichous or conglobate, broadly ellipsoid to subglobose, rounded at both ends, continuous, hyaline, 9–12 × 8-9 μ.

On *Tephrosia Nyassae* E. G. Baker, on leaves, Tzaneen, *van der Byl 1662*, 20447 (ex Herb. Sydow, portion of type collection).

**Phyllachora circinata** (Kalch. et Cke.) Theiss. et Syd.

Ann. Myc. 15 (1917) p. 141.

*Dothidea circinata* Kalch. et Cke., Grevillea IX (1880) p. 32.

*Parodiella circinata* (K. et Cke.) Sacc., Syll. Fung. I, p. 718.

Stromata on poorly defined, somewhat brownish or greenish leaf spots, single or in small groups, visible on both sides of the leaf, minute, up to 0·4 mm. diam., black, somewhat shiny.

Clypeus epidermal, on both sides of the leaf, dense black, opaque, 30–45 μ thick.

Perithecia solitary, deeply immersed, occupying the whole of the mesophyll. Asci not numerous, 8-spored, paraphysate, cylindrical, 55–70 × 9–12 μ. Spores monostichous, ellipsoid or ovate, continuous, hyaline, 9–11 × 5–6 μ.

On leaves of Leguminosae undet. (possibly *Phaseolus* sp. or *Dolichos* sp.), Natal, *Medley Wood 49*, Herb. Kew.

There was no opportunity of examining the type specimen; the details given above are taken from the description by Theissen and Sydow (l.c.).

On RUTACEAE.

**Phyllachora Teclеae** Doidge.

Bothalia I (1922) p. 68.

Stromata amphigenous, mostly epiphyllous, visible on both sides of the leaf, grouped on yellowish brown leaf spots which are usually oblong or elliptic in shape and run between two lateral veins of the leaf. Stromata oval-elliptic or almost round, 1·5–2·5 mm. long, 0·5–1 mm. broad, black, somewhat shining, raised, usually discrete, rarely becoming fused to form compound stromata.

Clypeus epidermal, well developed on both sides of the leaf, black, opaque, 40–50 μ thick in the upper epidermis, 23–25 μ thick in the lower. Stroma in the mesophyll consisting of light brown to hyaline hyphae, branched and reticulate, permeating the tissues between the two clypeal plates, the cells in this region becoming brown and dead.

Perithecia several in each stroma, deeply immersed, with base reaching the clypeus in the opposite epidermis, globose or flattened globose, 250–400 μ diam., 250–300 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, very copiously periphysate, with a circular pore ca. 15 μ broad. Perithecial wall concentric fibrose, ca. 20–25 μ thick, outer layers light brown, inner hyaline, not always sharply defined outwardly where it merges with the stromatal hyphae. Asci copiously paraphysate, 8-spored, cylindrical, with a short foot, 80–99 × 10–13 μ. Spores obliquely monostichous, continuous, hyaline, ellipsoid or subfusoid, tapering somewhat to rounded ends, 13–17 × 5–6 μ.

On *Teclea natalensis* Engl., Kentani, *Pegler 2324*, 9079.

On EUPHORBIACEAE.

**Phyllachora Crotonis** (Cke.) Sacc.

Syll. Fung. 2 (1883) p. 599; Theiss. and Syd., Ann. Myc. 13 (1915) p. 523; Doidge, Bothalia I (1922) p. 67.

*Dothidea Crotonis* Cke., Grevillea X (1882) p. 129.

*Phyllachora crotonicola* Pat., Bull. Soc. Myc. Fr. 9 (1893) p. 156.

*Trabutia crotonicola* Rehm., Hedwigia 29 (1890) p. 160.

*Phyllachora Julocrotonis* Bres., Hedwigia 35 (1896) p. 668.

Stromata grouped on indeterminate, yellow brown leaf spots which are visible on both sides of the leaf. Single stromata round, 0·3–0·5 mm. diam., black, somewhat shining, convex, very often closely crowded and forming larger, irregular, compound stromata which are not infrequently elongated along the veins of the host and are occasionally dendritic.

Clypeus developed in the epidermis on both sides of the leaf, brownish black, opaque, 20–30 μ thick in the upper epidermis, 8–10 μ thick in the lower, not extending beyond the perithecia. In compound stromata, the leaf tissue between the perithecia is permeated by light brown, branched, more or less reticulate hyphae, 2·5–4 μ thick.

Perithecia solitary in single stromata, but usually stromata become fused and a number of perithecia are found under a common clypeus. Perithecia deeply immersed,

occupying the whole thickness of the mesophyll, globose or somewhat flattened, 200–350 μ diam., 150–250 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with round pore ca. 15 μ broad. Perithecial wall concentric fibrose, light brown, composed of delicate hyphae 2·5–3 μ thick, indefinitely cellular, not sharply defined, merging outwardly with the stromatal hyphae and inwardly with the hyaline ascogenous layers. Asci copiously paraphysate, cylindrical to clavate, sp. part cylindrical, 80–90 × 11–14 μ, or clavate ellipsoid, 65–70 × 16–20 μ, rounded above, attenuated below into a short or longer stalk, usually 25–30 μ long, sometimes up to 50 μ. Spores obliquely monostichous in the cylindrical asci, imperfectly distichous in the clavate asci, broadly ellipsoid, broadly rounded at both ends, hyaline, continuous, 12.5–16 × 7·5–9 μ.

On *Croton sylvaticus* Hochst., on leaves, Inanda, *Medley Wood 406*, 9489 (Part of type collection).

Theissen and Sydow (l.c.) state that this fungus occurs on a number of *Croton* spp. throughout South America. They did not examine the original collection quoted above, but think there is no doubt that this South American species is identical with that collected in Natal by Medley Wood. This is confirmed by a comparison with a collection made by Dr. Sydow in Costa Rica, which is the only American collection in the Pretoria Herbarium.

On MELIANTHACEAE.

**Phyllachora Melianthi** (Thüm.) Sacc.

Syll. Fung. IX (1891) p. 1013; Theiss. and Syd., Ann. Myc. 13 (1915) p. 528; Doidge, Bothalia I (1921) p. 28.

*Rhytisma Melianthi* Thüm., Flora (1876) p. 569.

*Dothidea lucens* Cke., Grevillea X (1882) p. 128.

*Dothidea Melianthi* Kalch. et Cke., Grevillea X (1882) p. 146.

*Phyllachora lucens* (Cke.) Sacc., Syll. Fung. II (1883) p. 600; Theiss. and Syd., Ann Myc. 13 (1915) p. 562; Doidge, Bothalia I (1922) p. 68.

Not on leaf spots. Stromata amphigenous, mostly epiphyllous, scattered more or less thickly over large areas of the leaf surface, or (on *Bersama*) in more or less circular groups, mostly discrete, occasionally becoming confluent, small, black, circular to broadly elliptic in outline, 0·5–1·5 mm. diam., often raised, shining, and either rounded or conical in the centre with a flat, dull black margin; on the opposite side of the leaf, the epidermis is at first raised and greyish in appearance, but finally becomes filled with stromatic tissue and is dull black.

Clypeus epidermal, well developed over the perithecia, black, opaque, carbonaceous, 25–30 μ thick; not so well developed in the epidermis below the perithecia. Stroma in the mesophyll dark to light brown, formed of rather loosely reticulate hyphae, 2·5–4 μ thick, often forming a sterile border round single perithecia or filling the space between perithecia which are remote from one another but under a common clypeus.

Perithecia 1 or several in each stroma, solitary, crowded together and somewhat flattened laterally or remote from one another, globose or flattened globose, 240–350 μ diam. or (in stromata on *Bersama*) up to 450 μ diam., 240–300 μ high, deeply immersed. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a pore 12–15 μ broad. Perithecial wall not very well defined except where there is a common wall between two perithecia, 8–15 μ thick, light brown, concentric fibrose, merging outwardly with the hyphae forming the stroma and inwardly with the hyaline ascogenous layers. Asci 8-spored, cylindrical to clavate, rounded above, tapering below to a short foot or to a stalk up to 20 μ long, 60–80 × 12·5–18 μ. Spores monostichous in the cylindrical asci, incompletely distichous in the clavate asci, hyaline, continuous, ellipsoid, rounded at both ends, 12·5–15 × 6–8 μ.

On *Melianthus major* L., on leaves, Boschberg Mts., near Somerset East, *MacOwan 1266*, 20828 (de Thümen, Myc. Univ. 1267), 21974, this is part of the type collection; near Cape Town, *MacOwan* (Rabh. Wint. Fung. Eur. 3557), 3897; Stellenbosch, *van der Byl 228*.

*Bersama lucens* Szysz., Kentani, *Pegler*, 9077 (the wrong number was cited in Bothalia 1. c.).

*Bersama Swinnyi* Phill., Inanda, *Medley Wood 581* [Type collection of *Ph. lucens* (Cke.) Sacc.] 9487, 10443.

*Bersama Tysoniana* Oliver, West Wood, Haenertsburg, *Doidge*, 17776.

*Medley Wood 581*, "on leaves", described by Cooke as *Dothidea lucens*, is the same fungus as that on Melianthus and Bersama; the host is *Bersama Swinnyi* Phill., and stromata of the fungus were found in the phanerogamic herbarium on authentic material of this plant collected at Port St. Johns.

A collection on *Melianthus major*, No. 2427 in the van der Byl herbarium, and named *Phyllachora Melianthi*, collected by Dippenaar at Tulbagh, is a conidial form, with stromata in groups often following the veins ; the conidia are filiform, hyaline. There are no asci in this collection.

On TILIACEAE.

**Phyllachora Grewiae** (Kalch.) Theiss. et Syd.

Ann. Myc. 13 (1915) p. 530.

*Rhytisma Grewiae* Kalch., Grevillea IX (1880) p. 32.

Stromata on brown indefinite leaf spots, visible on both sides of the leaf, scattered, round, 1–2 mm. diam., quite flat on the upper side of the leaf ; flat on the lower side also, only slightly raised over the perithecia ; with rough surface, black, somewhat shiny.

Clypeus epidermal, on both sides of the leaf, ca. 20–25 $\mu$ thick. Perithecia several in each stroma, globose or irregular, 150–300 $\mu$ diam., perithecial wall brown, 10–12 $\mu$ thick. Asci cylindrical-clavate, 50–60 × 12–15 $\mu$, 8-spored, paraphysate. Spores distichous, fusiform, apparently 1-celled and hyaline, 20–23 × 4–5·5 $\mu$.

On *Grewia occidentalis*, Herb. Kew.

"South African Fungi" in Grevillea (l.c.) includes fungi collected by Medley Wood at Inanda as well as a number of MacOwan's Cape collections, and the locality is often not given. Judging by the sequence of the numbers quoted, however, this is probably *Medley Wood 106*.

This specimen was not available for study and the description is taken from that of Theissen and Sydow (l.c.). They remark that the type specimen is not mature and that there is some doubt whether the spores will remain 1-celled and hyaline.

On MALVACEAE.

**Phyllachora minuta** P. Henn.

Hedwigia 41 (1902) p. 143 ; Theiss. and Syd., Ann. Myc. 13 (1915) p. 531 ; Doidge, Bothalia 2 (1927) p. 231.

Not on leaf spots, or stromata grouped on small reddish brown or yellowish brown indeterminate leaf spots 1–1·5 mm. diam. Stromata amphigenous, visible on both sides of the leaf, minute, black, convex, circular in outline, 0·3–0·6 mm. diam., often in groups of 4–12 and not infrequently becoming confluent.

Clypeus epidermal, on both sides of the leaf, black, opaque, mostly 20–40 $\mu$ thick ; usually not extending far beyond the perithecia, but often fusing with clypeus of neighbouring stromata ; on the under side, the stellate hairs on the epidermis often become discoloured and brown. Stroma in the mesophyll consists of more or less closely reticulate pale fuscous or hyaline hyphae.

Perithecia solitary or few in each stroma, deeply immersed and occupying the whole thickness of the mesophyll, globose, flattened globose or flask-shaped, 250–350 $\mu$ diam., 200–350 $\mu$ high. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate. Perithecial wall delicate, purplish brown, ca. 10 $\mu$ thick, concentric fibrose, indistinctly cellular, closely appressed to the cells of the host and often inconspicuous. Asci cylindrical to clavate, 8-spored, sp. part 65–100 × 12·5–15 $\mu$, rounded above, tapering below to a short stalk. Spores monostichous or incompletely distichous, hyaline, continuous, ellipsoid or ovate, rounded at both ends, often broader near the upper end and tapering more or less downwards, 14–17·5 × 6–10 $\mu$. Paraphyses breaking down early.

On *Hibiscus tiliaceus* L., on leaves, Port Shepstone, *Pole Evans*, 5604 ; near Durban, *van der Byl 227*, 32450.

This species was originally described by Hennings on a *Hibiscus* sp. collected in Java. Theissen and Sydow record it on *Hibiscus tiliaceus* and *Thespesia populnea* from Java, the Philippines and Australia.

On STERCULIACEAE.

**Phyllachora Burgessiae** Doidge nov. spec.

Stromata sine maculis, amphigena vel petiolicola, plerumque epiphylla in una folii pagina tantum praesentia, subinde autem opposita, sparsa, ambitu irregularia, primitus minuta, usque 2 mm. diam., dein majora saepeque secus folii venas elongata et usque 5 mm. longa, fortiter convexa, atra, in epiphyllo nitida, in hypophyllo opace atra ; clypeo epidermali et subepidermali supra perithecia fortissime evoluto, opace atro, carbonaceo, usque 95 $\mu$ crasso ; clypeo in hypophyllo parce evoluto vel, si magis evoluto, haud continuo ; perithecia 2 vel numerosa in quoque stromate, profunde immersa, subglobosa vel e pressione

plus minus irregularia, 150–230 μ diam., 230–280 μ alta, ostiolo plano papilliformi, clypeo omnino immerso, periphysato, poro rotundato ca. 15 μ lato aperto; pariete atro vel atro-brunneo, opaco, concentrice fibrose, 12·5–25 μ crasso; asci paraphysati, 8-spori, cylindracei, 75–90 × 10–11·5 μ. Sporae monostichae, hyalinae, continuae, ellipsoideae, 10–12·5 × 5–6·3 μ.

Hab. in foliis *Dombeyae Burgessiae*, Cloudlands, prope Umtali, Rhodesia, leg. Mogg, 30149.

Not on leaf spots, but causing some reddish brown discoloration of the leaf tissues in the immediate vicinity of the stromata. Stromata amphigenous and petiolicolous, mostly epiphyllous, usually only on one side of the leaf, but sometimes developing opposite to one another, scattered, irregular in outline; at first small, up to 2 mm. diam., later increasing in size, frequently becoming elongated along the veins and up to 5 mm. long; strongly convex, black, shining on the upper leaf surface, dull black on the under surface.

The leaf, which is normally about 80 μ thick, is up to 150 μ thick in areas where stromata have developed. Clypeus over the perithecia developing in epidermal and subepidermal cells, massive, opaque, black, carbonaceous, up to 95 μ thick, not extending more than 100 μ beyond the perithecia; sometimes a similar clypeus is formed below the perithecia, but often it is comparatively poorly developed. Stroma in mesophyll consists of brown to subhyaline, branched, more or less closely reticulate hyphae 2·5–5 μ thick, permeating the cells under the clypeus but not extending much beyond it; the invaded cells become discoloured and dead.

Perithecia 2 to numerous in each stroma, deeply immersed and often with base on the opposite epidermis, globose, flattened globose or irregular, 150–230 μ diam., 230–280 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a circular pore ca. 15 μ broad. Perithecial wall stout, well developed, blackish brown, opaque, 12·5–25 μ thick, concentric fibrose, composed of brown hyphae ca. 2·5 μ thick. Asci paraphysate, 8-spored, cylindrical, 75–90 × 10–11·5 μ. Spores monostichous, hyaline, continuous, ellipsoid, 10–12·5 × 5–6·3 μ.

On *Dombeya Burgessiae* Gerr., Woodbush, *Doidge*, 17732 and 21762; Cloudlands, near Umtali, S. Rhodesia, *Mogg*, 30149, Type.

*Dombeya pulchra* N.E.Br., Nelspruit, *Liebenberg*, 29917.

No. 1762 was cited in Bothalia I (1921) p. 28, as *Phyllachora Dombeyae* Syd. It is on *Dombeya Burgessiae* not on *D. Schimperiana* as stated, and the stromata are probably those of *Phyllachora Burgessiae*; the stromata are very old, showing neither asci nor spores. Most of the perithecia are empty, but in some there are conidia which possibly belong to a fungus parasitic in the stroma.

**Phyllachora Dombeyae** Syd.

Ann. Myc. 15 (1917) p. 532; Doidge, Bothalia I (1921) p. 28.

*Physalospora Dombeyae* Syd., Ann. Myc. 10 (1912) p. 441.

Stromata epiphyllous, grouped on poorly defined, yellowish brown leaf spots which are more or less circular in outline and up to 5 mm. diam., but are often numerous and coalesce to form larger, irregular brown areas; the discoloration of the tissues is visible also on the under side of the leaf. Stromata round, 0·3–0·5 mm. diam., slightly convex, black, rather shiny, not visible on the under side of the leaf, or visible only as minute, dull black specks.

Clypeus well developed in the upper epidermis, but usually not extending beyond the perithecia, brownish black, opaque, 10–50 μ thick; when the base of the perithecium is near the lower epidermis, a short clypeus ca. 25 μ thick is formed below the perithecium. Stroma in the mesophyll poorly developed.

Perithecia 1 or few in each stroma, more or less deeply immersed, mostly globose, sometimes compressed laterally and then oval or oblong 130–220 μ diam., 150–220 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a round pore 15–20 μ broad. Perithecial wall rather weak and poorly defined, pale golden brown to subhyaline, concentric fibrose, closely appressed to the cells of the host. Asci copiously paraphysate, clavate, rounded at the apex, 8-spored, 60–75 × 15–20 μ. Spores distichous to tristichous, continuous, hyaline, ellipsoid, tapering somewhat to the rounded ends, asymmetrical, straight or slightly curved, 25–35 × 3–4·5 μ.

Conidia also present, in pycnidia similar in form to the perithecia, filiform, curved in various ways, often uncinate, continuous, hyaline, 18–26 × 1–1·5 μ.

On *Dombeya rotundifolia* Planch., on leaves, Equeefa, Zululand, *Fuller*, 1539, Type ; Tzaneen, *Liebenberg*, 30962.

*Dombeya pulchra* N.E.Br., Nelspruit, *Liebenberg*, 26003.

On OCHNACEAE.

**Phyllachora microstegia** Syd.

Ann. Myc. 22 (1924) p. 430.

Stromata amphigenous, not on leaf spots but usually causing some yellowish brown discoloration of the leaf tissues. Stromata set closely and fairly evenly in groups, which are more or less extensive, irregular in shape, 0·5–2 cm. long. Stromata always discrete, very minute, punctiform, raised and convex on both leaf surfaces, 120–200 μ diam.

Epidermal clypeus amphigenous, blackish brown, opaque, 10–15 μ thick, obscurely parenchymatous. Stroma in mesophyll not conspicuous.

Perithecia usually solitary, rarely two are crowded under one clypeus, globose or flattened globose, 120–174 μ diam., 120–150 μ high. Ostiole flat or very slightly raised, papilliform, completely immersed in the clypeus, with a round pore ca. 15 μ broad. Perithecial wall fairly well defined, light brown, 10–12 μ thick, concentric fibrose, indistinctly cellular. Asci paraphysate, cylindrical or cylindrical clavate, 8-spored, 50 × 8–12 μ. Spores monostichous, ellipsoid, hyaline, continuous, rounded at both ends, 9–11 × 5 μ.

On *Ochna Holstii* Engl., Woodbush, Northern Transvaal, *van der Byl 1498*, 20448 (portion of Type, ex Herb. Sydow).

On FLACOURTIACEAE.

**Phyllachora Aberiae** P. Henn.

Engl. bot. Jahrb. 41 (1908) p. 272 ; Theissen and Sydow, Ann. Myc. 13 (1915) p. 534 ; Doidge, Bothalia I (1921) p. 29.

Often causing a vague, yellowish brown discoloration of the leaf tissues, which is usually more conspicuous on the under side of the leaf ; occasionally on definite, light brown leaf spots. Stromata mostly epiphyllous, but often visible also on the under side of the leaf, scattered or more or less closely grouped ; very frequently secondary stromata develop in a concentric ring round an older stroma, sometimes fusing in a more or less complete circle and thus forming round groups 3–4 mm. diam. Single stromata more or less circular in outline, 0·5–1 mm. diam., black, somewhat shining, slightly convex.

Clypeus amphigenous, but better developed and more extensive in the upper epidermis, where it is blackish brown, opaque, continuous, 25–35 μ thick. Stroma in the mesophyll, between the base of the perithecia and the lower clypeus composed of brown, branching, more or less closely reticulate hyphae 2·5–3 μ thick ; elsewhere it is pale and inconspicuous.

Perithecia several in each stroma, deeply immersed, subglobose, 240–270 μ diam., to flask-shaped, 180–220 μ diam., and 240–300 μ high. Ostiole papilliform, flat, completely immersed in the clypeus, periphysate, with a round pore ca. 10 μ broad. Perithecial wall dark brown, firm, 20–30 μ thick, concentric fibrose, consisting of hyphae 2·5–3 μ thick, often more or less distinctly cellular. Asci copiously paraphysate, numerous, 8-spored, straight or curved, sp. part ellipsoid, tapering somewhat to a rounded apex, rarely cylindrical, 75–90 × 12–20 μ ; attenuated below into a stalk which is usually short, 8–10 μ long, but occasionally up to 22 or 30 μ long. Spores monostichous or incompletely distichous, often more or less imbricate, cylindrical and obtuse at both ends, or subclavate, rounded at the upper end, hyaline, continuous, 25–35 × 4·5–6 μ ; thick-walled, wall ca. 1 μ thick.

On *Dovyalis caffra* Warb. (= *Aberia caffra*), on leaves, Uitenhage, *Lounsbury*, 202, 224 (Type collection) and *Pienaar*, 2420 ; Driefontein, Zoutpansberg, *Doidge*, 1813.

On MYRTACEAE.

**Phyllachora capensis** Doidge nov. comb.

*Scolecodothis capensis* Doidge, Bothalia I (1921) p. 27.

Not on leaf spots. Stromata epiphyllous, scattered, more or less circular in outline, 1–1·5 mm. diam., black, shining, convex, occasionally becoming confluent and producing larger, irregular, compound stromata. Smaller stromata observed on the under side of the leaf where usually flat and sterile or ? producing conidia ; no perithecia were observed in these.

Clypeus originating in the epidermis, massive, black, opaque, 90–100 μ thick ; between the arched clypeus and the palisade cells of the leaf, around the perithecia, the stroma is often subopaque, composed of brown, thin-walled cells, more or less vertical and prosenchymatous or irregularly parenchymatous in structure. Stroma in the mesophyll is

represented by a few brown hyphae 2–5 μ thick; these are sometimes connected with the sterile stroma on the under side of the leaf.

Perithecia usually solitary in individual stromata, up to 4 or 5 in compound stromata, ellipsoid to lenticular or somewhat irregular through lateral pressure, with flat or slightly concave base pressing against the palisade cells of the host, 550–650 μ diam., 200–250 μ high. Ostiole flat, papilliform, periphysate, completely immersed in the clypeus. Perithecial wall ca. 10 μ thick at the base, consisting of a few layers of delicate, dark brown hyphae; at the sides merging with the hyphae forming the stroma and not clearly differentiated. Asci paraphysate, 8-spored, narrow-ellipsoid, tapering to both ends, pedicellate, 100–120 × 13–14 μ. Spores parallel, hyaline or slightly tinted at maturity, narrow-fusiform, tapering to both ends, 60–70 μ long, 5–6 μ thick in the centre. Paraphyses disappearing early.

On *Eugenia Zeyheri* Harv., on leaves, Howieson's Poort, *Doidge*, 10963, 12379; Van Standen's Pass, *Doidge*, 10869.

*Eugenia zuluensis* Dümmer, Highbury, Natal, *Doidge*, 33151.

This fungus was originally described as a Scolecodothis (l.c.), the Phyllachoraceous genus in Theissen and Sydow's classification with Catacauma-like stroma, paraphysate asci and 1-celled filiform spores. The proportion of the length of the spores to their breadth is approximately 12 : 1 and they are therefore too stout to be regarded as filiform. Clements (1, p. 9) suggests that a ratio of 20 : 1 in the Sphaeriales should be regarded as the most natural dividing line.

The host was wrongly identified as *Olea foveolata*.

**Phyllachora goyazensis** P. Henn.

Hedwigia 34 (1895) p. 110.

*Catacauma goyazense* (P. Henn.) Theiss. et Syd., Ann. Myc. 13 (1915) p. 396; Doidge, Bothalia II (1927) p. 231.

Not on definite leaf spots, but the leaf tissues around the stromata often show a light brown discoloration. Stromata epiphyllous, small, black, shining, convex, round to angular in outline, usually becoming confluent in groups which are very irregular in form. Groups often numerous and thickly set on the leaf surface.

Clypeus originating in the epidermis, massive, black, opaque, 60–75 μ thick, often fusing with the clypeus of adjoining stromata and extending over the compound stroma. Stroma between the arched clypeus and the palisade cells of the leaf, around the stromata, dark purplish brown, subopaque, indistinctly vertical and prosenchymatous in structure. Stroma in the mesophyll poorly developed.

Perithecia mostly distant, solitary, flattened globose to lenticular with concave base pressing against the palisade cells of the leaf, 400–500 μ diam., 220–300 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a pore ca. 25 μ broad. Perithecial wall light to dark brown, concentric fibrose, at the base closely appressed to the cells of the host and ca. 10 μ thick, at the sides not sharply defined and merging with the hyphae forming the stroma. Asci paraphysate, 8-spored, cylindrical, 75–85 × 12–15 μ. Spores monostichous, hyaline, continuous, ellipsoid, rounded at both ends, 13–16 × 6–8 μ. Paraphyses numerous, hyaline, filiform.

On *Eugenia natalitia* Sond., on leaves, Kentani, *Pegler 2110*, 9113; ? Natal, *Medley Wood 599*, 10701.

Very little material of this fungus is available; it agrees closely with the description of the South American species *Phyllachora goyazensis*, but further collections are desirable and should be compared with authentic specimens of *Ph. goyazensis* when opportunity offers.

Medley Wood's collection is under the name *Rhytisma eugeniaceorum*; no author is mentioned and no description has been found of such a species. The material is old, but is on the same host as the Kentani collection and is apparently identical with it.

**Phyllachora Peglerae** Doidge nov. comb.

*Catacauma Peglerae* Doidge, Bothalia I (1921) p. 25.

Not on leaf spots. Stromata epiphyllous, 1–2 mm. diam., circular in outline, convex, conical, black, shining, often in groups and becoming confluent, forming larger, irregular compound stromata. A single stroma or group of stromata is often surrounded by a ring of secondary stromata at a radius of 2–5 mm.; the latter may be small and discrete or fuse to form a continuous ring.

Clypeus only on the upper side of the leaf, originating in the epidermis and becoming arched over the perithecia, massive, black, opaque, ca. 30 $\mu$ thick over the sterile part of the stroma, varying from 50–100 $\mu$ thick over the perithecia. Stroma between the perithecia and forming a sterile border round them under the extended clypeus, greyish brown to olive brown, pale near the margin, dark and subopaque near the perithecia, indistinctly parenchymatous in structure; the clypeus extends to a radius of 500 $\mu$ beyond the perithecia. Stroma in the mesophyll poorly developed.

Perithecia solitary or several in each stroma, lenticular to broadly flask-shaped, 400–600 $\mu$ diam., 350–500 $\mu$ high, with slightly concave base pressing against the palisade cells of the leaf. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a round pore 15–20 $\mu$ broad. Perithecial wall thin, ca. 10 $\mu$ thick, at the base, closely appressed to the cells of the host, consisting of a few layers of indistinctly septate, subhyaline to olive brown hyphae ca. 2·5 $\mu$ thick; at the sides the wall is not sharply defined, merging outwardly with the hyphae forming the stroma. Asci 8-spored, clavate-cylindrical, sp. part 120–140 × 17–20 $\mu$, with a short stalk 10–13 $\mu$ long. Spores monostichous or incompletely distichous, continuous, hyaline, oval to ellipsoid, rounded at both ends. 20–23 × 12–13 $\mu$.

Pycnidia usually present in the same stromata, closely associated with the perithecia and often interspersed with them, narrow lenticular or irregular in form, 400–600 $\mu$ diam., 100–150 $\mu$ high, covered by the epidermal clypeus. Conidia very numerous, produced on palisade-like conidiophores at the base of the pycnidium, hyaline, fuscous in mass, filiform, curved, ca. 20–25 $\mu$ long and 0·5 $\mu$ thick.

On *Eugenia capensis* Harv., on leaves, Kentani, *Pegler 2340*, 9099, Type; Umbogintwini, Natal, *Doidge*, 6636; Scottsburgh, *Pole Evans*, 6841; Warner Beach, *Bottomley*, 11667.

**Phyllachora Woodiana** Doidge nov. spec.

Sub *Phyllachora gentilis* Speg. in Herb. Medley Wood.

Stromata sine maculis, amphigena, plerumque epiphylla, sparsa, opace atra, ambitu orbicularia vel elliptica, ca. 1 mm. diam. vel usque 1·5 × 1 mm.; clypeo in utraque folii pagina evoluto, atro, opaco, 50–80 $\mu$ crasso; stromate in mesophyllo ex hyphis reticulato-contextis, hyalinis, ca. 1·5 $\mu$ crassis contexto. Perithecia plerumque complura, plus minus stipata, globosa, depresso-globosa vel ovata, saepe valde irregularia, 250–400 $\mu$ diam., 200–250 $\mu$ alta, ostiolo plano, papilliformi v. obtuse conico, clypeo omnino immerso, periphysato praedita; pariete perithecii ca. 10–15 $\mu$ crasso, subhyalino, concentrice fibroso. Asci numerosi, 8-spori, cylindracei, apice rotundati, breviter pedicellati, 80–100 × 6–7·5 $\mu$. Sporae (vix maturae) monostichae, ellipsoideae, utrinque rotundatae, hyalinae, continuae, 12·5–15 × 5–6 $\mu$.

Hab. in foliis *Eugeniae capensis*, prope Durban, leg. Medley Wood, 9477 (*Medley Wood 6462*).

Not on leaf spots. Stromata amphigenous, mostly epiphyllous, visible also on the opposite side of the leaf, scattered, raised, disc-like, dull black, round, ca. 1 mm. diam. or somewhat elongated and up to 1·5 × 1 mm.

Clypeus over the perithecia in the epidermal and subepidermal cells black, opaque, 50–80 $\mu$ thick; sometimes not so well developed and not continuous in the opposite epidermis. Stroma in the mesophyll consists of fine hyaline hyphae, ca. 1·5 $\mu$ thick, more or less closely reticulate and permeating the cells of the host.

Perithecia several in each stroma, deeply immersed, often crowded together and in contact laterally; occasionally stromata develop opposite to one another on either side of the leaf and the perithecia are apparently in two series, somewhat compressed and irregular in form. Perithecia usually globose, flattened globose or ovate, 250–400 $\mu$ diam., 200–250 $\mu$ high. Ostiole flat, papilliform or bluntly conical, completely immersed in the clypeus, lined within with short, filiform, hyaline periphyses. Perithecial wall pale yellow brown to subhyaline, ca. 10–15 $\mu$ thick, delicate, concentric fibrose. Asci numerous, paraphysate, 8-spored, cylindrical, rounded above, tapering below to a short foot, 80–100 × 6–7·5 $\mu$. Spores monostichous, ellipsoid, rounded at both ends, hyaline, continuous, 12·5–15 × 5–6 $\mu$. (Asci and spores are barely mature).

On *Eugenia capensis* Harv., on leaves, near Durban, *Medley Wood 6462*, 328, 9477.

According to Theissen and Sydow (Ann. Myc. 13, 1915, p. 567) the type of *Phyllachora gentilis* has no clypeus and is therefore not a Phyllachora; it is evidently not identical with the fungus described above.

On MYRSINACEAE.

**Phyllachora myrsinicola** Doidge.

Bothalia I (1921) p. 81.

Not on leaf spots nor causing any marked discoloration of the leaf tissues. Stromata epiphyllous, scattered, usually remote from one another, rarely contiguous and becoming fused, round, only slightly raised, disk-like, not convex, 0·5–1 mm. diam., black, somewhat shiny.

Clypeus only on the upper side, blackish brown, opaque, formed of parenchymatous cells 4–6 $\mu$ diam., 18–25 $\mu$ thick over the mesophyll between the perithecia, 30–40 $\mu$ thick over the perithecia. Stroma well developed in the upper part of the mesophyll, where the cells of the host are permeated by a more or less close stroma tissue, more or less closely parenchymatous and brown under the clypeus and often immediately below the perithecia, becoming paler and looser in texture below, formed of hyphae 4–6 $\mu$ thick.

Perithecia several in each stroma, immersed, occupying about half the thickness of the leaf, which in areas occupied by the stroma is distended to about twice its normal thickness, not closely crowded, often remote from one another, globose or flattened globose, 100–240 $\mu$ diam. Ostiole flat, papilliform, sparsely periphysate, immersed in the clypeus, with a rather indefinite pore 20–30 $\mu$ broad. Perithecial wall not well defined, pale, concentric fibrose, ca. 10 $\mu$ thick. Asci numerous, completely filling the perithecial cavity, 8-spored, clavate, broadly rounded above, tapering more or less downwards to a short foot, 80–100 × 20–27 $\mu$, thick-walled. Spores distichous, hyaline, continuous, ellipsoid or more or less rhomboid, 16·5–23·5 × 9–10 $\mu$. Paraphyses rather sparse, disappearing early.

On *Myrsine melanophleos* R. Br. (= *Rapanea melanophleos* Mey.), on leaves, Duncairn, near Maritzburg, *Doidge*, 15015, Type; Greytown, *Doidge*, 15530; Howieson's Poort, near Grahamstown, *Doidge*, 12376; Woodbush, northern Transvaal, *Doidge*, 1756; Noetze, Knysna District, *van der Byl 2287*.

On SAPOTACEAE

**Phyllachora Baumii** P. Henn.

Ergebnisse der Kunene-Sambesi Exped. (1902) p. 166; Theiss. and Syd., Ann. Myc. 13 (1915) p. 546.

Stromata arranged in circles near the periphery of round or elliptic leaf spots, which are sharply defined, 3–7 mm. diam., silver grey on the upper side of the leaf and dark brown on the under side. The Stromata are always near the margin of these spots and are visible on both sides of the leaf. At first the leaf spots are not bordered, but later are defined by a distinct brown or black line; when infection is heavy, numerous spots run into one another and form extensive, fantastically lobed areas bordered by a single common black line.

Stromata round, disk-like, 0·5 mm. diam. Perithecia solitary in each stroma, globose, 330–360 $\mu$ diam., occupying the whole of the mesophyll of the leaf; perithecial wall thin, greyish brown, consisting of rather loosely interwoven stromatal hyphae and fusing above and below with the epidermal clypeus. Ostiole always opening toward the under side of the leaf, where the clypeus is usually somewhat shorter and thinner than on the upper side. Asci paraphysate, oblong-clavate, 90–105 × 8–10 $\mu$. Spores oblong, fusiform or subclavate, continuous, hyaline, 15–18 × 5–7 $\mu$.

On *Sideroxylon* sp., on leaves, Jau, S.W. Africa, *Baum 1002*.

There has been no opportunity of studying this fungus and the description is taken from that of Theissen and Sydow (l.c.).

**Phyllachora placida** (Syd.) Theiss.

Ann. Myc. 14 (1916) p. 424.

*Physalospora placida* Syd., Ann. Myc. 7 (1909) p. 544.

Stromata visible on both sides of the leaf, more or less round, 2–3·5 mm. diam., dull black or blackish brown, flat, slightly raised and convex over the perithecia and more prominently so on the upper than the under surface; surrounded by a definite, raised reddish brown or purplish brown zone about 0·5 mm. broad of discoloured leaf tissue.

Upper clypeus extensive, filling the epidermis which consists of 2 layers of cells, 25–30 $\mu$ thick, black, opaque; the cuticle, which is 6 $\mu$ thick remains intact over the clypeus; the lower clypeus is equally extensive, involving the epidermis and the subepidermal cells, but is irregular in thickness, 25–50 $\mu$; the structure is obscurely parenchymatous. The stroma permeates the mesophyll between the two clypeal plates and consists of more or less closely reticulate, branching, light brown to hyaline, hyphae, 2·5–4 $\mu$ thick.

Perithecia usually remote from one another, sometimes in rather close groups of 2–3, deeply immersed, with base near the upper clypeus, subglobose or somewhat flask-shaped, often somewhat broader than long, 250–440 μ diam., 220–300 μ high. Ostiole obtusely conical, immersed in the lower clypeus and with a rather indefinite pore 20–25 μ broad. Perithecial wall pale brown to hyaline, not well defined, concentric fibrose. Asci 8-spored, cylindrical or cylindrical-fusiform, rounded or tapering somewhat at the apex, briefly spipitate, 62–88 × 11–15 μ. Spores distichous, subcylindrical or subclavate, rounded above, tapering somewhat to the base, straight, hyaline, 21–28 × 4 μ. Paraphyses numerous, filiform, exceeding the asci.

On *Mimusops caffra* E. Mey., on leaves, Lourenco Marques. *Howard*, 669.

On BORRAGINACEAE.

**Phyllachora caffra** Syd.

Ann. Myc. 13 (1915) p. 548; Doidge, Bothalia I (1921) p. 27.

*Physalospora caffra* Syd., Ann. Myc. 10 (1912) p. 39.

Stromata grouped on rusty brown leaf spots, which are irregular in form and not sharply defined, epiphyllous, convex, black, shining, round, 250–350 μ diam.; on the lower leaf surface the epidermis is raised and later the stroma becomes visible as a minute, dull black point.

Clypeus in the upper epidermis short, not extending beyond the single perithecium, brownish black, opaque, 20–50 μ thick; clypeus in the lower epidermis shorter and sometimes poorly developed. Stroma in the mesophyll sparse.

Perithecia solitary, deeply immersed and extending from the upper to the lower clypeus, globose, 250–300 μ diam. Ostiole flat, papilliform, completely immersed in the clypeus, periphysate, with a pore ca. 10 μ broad. Perithecial wall not well defined, hyaline or yellowish, concentric fibrose. Asci paraphysate, 8-spored, cylindrical, 75–90 × 9–12 μ. Spores monostichous, broadly ellipsoid, hyaline, continuous, 11–13 × 6–8 μ. Paraphyses filiform, exceeding the asci.

On *Cordia caffra* Sond., on leaves, Amanzimtoti, *Doidge*, 1631.

**PHAEOCHORELLA** Theiss. et Syd.

**Phaeochorella Parinarii** (P. Henn.) Theiss. et Syd.;

Ann. Myc. 13 (1915) p. 405; Doidge, Bothala II (1921) p. 26.

*Cocconia Parinarii* P. Henn., Engl. bot. Jahrb. 31 (1901) p. 257.

Stromata always epiphyllous, scattered, round to irregular in outline, 1–6 mm. diam. the stromata on *Parinarium capense* usually being smaller than those on *Parinarium mobola*, often very numerous, becoming crowded and occasionally confluent. When the stromata are remote from one another, an irregular ring of younger stromata often develops with the older stroma in the centre and a diameter of 8–12 mm. Stromata convex, up to 450 μ high, black, crustaceous, with rough, uneven surface.

Clypeus epidermal, black, carbonaceous, massive, 40–60 μ thick, originating in the epidermal cells and becoming arched over the perithecia, parenchymatous, formed of dark olive brown, round, angular or somewhat elongated cells ca. 5–8 μ diam. Stroma surrounding the perithecia, between the clypeus and the palisade cells of the leaf light brown, indefinite in structure, composed of more or less closely interwoven, branched hyphae, 2·5–4 μ thick. Stroma poorly developed in the mesophyll.

Perithecia several in each stroma, with flat or slightly concave base pressing against the palisade cells of the leaf, usually in close groups, flattened globose to flask-shaped, or irregular through mutual lateral pressure, 200–500 μ diam., 200–300 μ high. Ostiole flat, papilliform, completely immersed in the clypeus, sparsely periphysate, with an irregularly circular pore ca. 20–25 μ broad. Perithecial wall well developed, brown, 15–25 μ thick, concentric fibrose, consisting of rather delicate, indistinctly septate hyphae 2–2·5 μ thick. Asci paraphysate, 8-spored, cylindrical, 85–100 × 11–15 μ, rounded above, tapering below to a short stalk. Spores monostichous, oblong, broadly rounded at both ends, continuous, dark brown with a narrow, hyaline medial zone, 12–17 × 6–9 μ. Paraphyses fibrose, breaking down early.

On *Parinarium capense* Harv., on leaves, Pretoria, *Doidge*, 613, 1507, 2203, *Erasmus*, 1272 and *Janse* (*van der Byl 1307*); Natal, *Pole Evans*, 10981; Buffelspoort, near Marikana, *Pallister*, 17825; Wonderboom, near Pretoria, *Schonland*, 21983; Silverton Ridge, near Pretoria, *Doidge*, 23409; Daspoort, Pretoria, *Kresfelder*, 30817; Donkerpoort, near Pretoria, *Doidge and Bottomley*, 29729; Waterkloof Ridge, near Pretoria, *Doidge*, 29855; Nelspruit, *Wager*, 23411 and *Liebenberg*, 25497.

*Parinarium curatellifolium* Planch., Magoeba's Kloof, 9173; also from East Africa, *Stoltz 1545*, 23410.

*Parinarium mobola* Oliv. Rhodesia, *Howard*, 730; Letaba Drift, *Doidge*, 1809; Rua River, near Salisbury, *Eyles 1347*, 23412 and *van der Byl 2438*; Louis Trichardt, *Power*, 30113; Zoutpansberg, *van der Byl 2741*; Mazoe, *Eyles 5279* (*van der Byl 2507*); Woodbush, *K. M. Putterill*, 32750 and *van der Byl 1526*.

This fungus was originally described by Hennings (l.c.) from a collection on *Parinarium mobola* made by Goetze in "upper Kondeland", Tanganyika Territory. It is very common and widespread on *Parinarium* spp. in South Africa.

**ENDODOTHELLA** Theiss. et Syd.

**Endodothella Deightonii** Syd.

Ann. Myc. 36 (1938) pp. 162–163.

*Phyllachora Albizziae* Cke., G. evillea XIII (1885) p. 65.

*Dothidea viventis* var. *Albizziae* Cke., ibid.

*Homostegia Albizziae* (Cke.) Berl. et Vogl., in Sacc. Syll. Fung. IX, p. 1049.

sub *Phragmocauma viventis* (Cke.) Theiss. et Syd., Ann. Myc. 13 (1915) p. 411; Doidge, Bothalia I (1921) p. 27.

Stromata always hypophyllous, not on leaf spots, but causing some yellowish- or greenish-brown discoloration of the leaf tissues which is visible also on the upper side of the leaf. Stromata scattered irregularly over the leaf surface, small, circular to elliptic or angular and irregular, usually 0·5 1 mm. diam.; often numerous and becoming confluent, forming linear or branched, dendritic compound stromata, following the veins and up to 3 mm. long or only limited in length by the extent of the vein, ca. 0·3 0·5 mm. broad, dull black or slightly shiny, convex.

Epidermal clypeus 25-45 $\mu$ thick, formed of blackish brown, fibrose or microparenchymatous, almost opaque tissue. Stroma in the mesophyll poorly developed and consisting of a loose and indefinite network of hyphae, which are septate, 2-3 $\mu$ thick, subhyaline to pale yellowish or greyish brown.

Perithecia more or less deeply immersed in the mesophyll, one to many in each stroma, globose, flattened globose or irregular through mutual lateral pressure, 100 350 $\mu$ diam., 150 200 $\mu$ high. Ostiole flat, broad, papilliform, immersed in the clypeus, with a round pore 15-20 $\mu$ broad. Perithecial wall concentric fibrose, usually about 10-17 $\mu$ thick, pale olive brown at the base and the lower part of the sides, darker and thicker above and finally merging with the clypeus. Asci numerous, cylindrical to cylindrical-clavate, obtuse above or tapering somewhat to the rounded apex, narrowed below abruptly or rather gradually to a short stalk usually about 5 $\mu$ long, but occasionally with a rather long stalk up to 30 $\mu$ long, 8-spored, rarely 4-6-spored, sp. part 75–100 × 12–14 $\mu$ with a firm wall (*fide* Sydow 55-85 × 8-14 $\mu$ thin-walled). Spores obliquely monostichous or imperfectly distichous, oblong or oblong-fusoid, rounded at both ends, usually somewhat asymmetrical, hyaline, 1-septate, not constricted, 20-27·5 × 6–7·5 $\mu$ (*fide* Sydow 14-20 × 4-5 $\mu$); cells subequal or the upper slightly shorter (10–12·5 $\mu$ long) and the lower (12–15 $\mu$ long) tapering somewhat towards the base, thick-walled, wall ca. 1 $\mu$ thick. Paraphyses numerous, filamentous, ca. 1·5–2 $\mu$ thick, thin-walled.

On *Albizzia gummifera* (Gmel.) C. A. Smith (= *Albizzia fastigiata* Oliv.) on leaves, Inanda, *Medley Wood 583*, 9492, 10445, type collection of *Phyllachora Albizziae* Cke.; Winkle Spruit, *Pole Evans*, 1401, 1583; Stella Bush, Durban, *Doidge*, 1615; Verulam, *Pole Evans*, 6829; Umkomaas, *Bottomley*, 11889; Phoenix, Natal, *Wager*, 33097; Durban, *van der Byl 209*.

The Inanda collection, *Medley Wood 583*, was described by Cooke (l.c.) as *Phyllachora Albizziae* (Syn. *Dothidea viventis* var. *Albizziae*) with the following details:—

"Epiphylla, minuta, convexa, nitida, vix 1 mm. diam., loculis paucis (1–4). Ascis clavatis, breviter stipitatis, sporidiis lanceolatis, medio constrictis, uniseptatis, binucleatis demum triseptatis, hyalinis, 0·25–0·27 × ·007 mm."

Medley Wood's fungus differs from this description in that the stromata are always hypophyllous. In a very large number of preparations examined, no 3-septate spores could be detected; they are always 1-septate and are not constricted.

Following Cooke, Theissen and Sydow identified this fungus with *Dothidea viventis* from India, which they renamed *Phragmocauma viventis*. Dr. Sydow recently examined a small portion of the type of the Indian fungus; the host differs from *Albizzia gummifera* and is possibly not an *Albizzia* sp., the stroma on this leaf is epiphyllous and is said to have

3-septate spores. It seems certain, therefore that the South African fungus is not identical with the Indian *Phragmocauma viventis*.

The spores are 2-celled and the fungus is an Endodothella, but the name *End. Albizziae* has been used by Sydow (Ann. Myc. 13, 1915, p. 590) for a Philippine species with much smaller stromata and spores.

The South African fungus agrees in every particular with the species on *Albizzia gummifera* from Sierra Leone described by Sydow as *End. Deightonii* except that the asci and spores are somewhat larger. It is probable that this is a somewhat variable species occurring throughout Africa on Albizzia.

**Endodothella natalensis** Doidge.

Bothalia I (1921) p. 30.

Not on leaf spots, but causing some yellowish brown discoloration of the leaf tissues near the stromata. Stromata epiphyllous, minute, punctiform, about 0·3–0·5 mm. diam., black, shiny, somewhat convex, not infrequently becoming confluent and forming larger, compound stromata; on the under side of the leaf the epidermis is often discoloured and slightly raised, forming minute brown blisters.

Clypeus only in the upper epidermis, blackish brown, opaque, 30–40 $\mu$ thick, usually not extending beyond the perithecia, formed of dark olive brown, closely interwoven hyphae, 2–2·5 $\mu$ thick. Stroma in the mesophyll usually poorly developed except between the perithecia where it is rather closely reticulate or loosly parenchymatous, formed of olive brown hyphae 2.5–4 $\mu$ thick.

Perithecia 1–2, rarely 3, in each individual stroma, more in the compound stromata, deeply immersed, subglobose to ellipsoid, 240–320 $\mu$ diam., 190–240 $\mu$ high. Ostiole flat, conical-truncate, completely immersed in the clypeus, periphysate, with a round pore 10–20 $\mu$ broad. Perithecial wall dark brown, well developed, subopaque, 13–15 $\mu$ thick, concentric fibrose, composed of brown hyphae 2·5–3 $\mu$ thick. Asci paraphysate, 8-spored, ellipsoid or cylindrical, straight or curved, rounded above, narrowed below into a short stalk 6–7 $\mu$ long, 80–87 × 15–17 $\mu$. Spores distichous or obliquely monostichous, hyaline, 1-septate, not constricted, fusiform, tapering to obtuse ends, 20–23·5 × 8·5–10 $\mu$, thick-walled, wall 1·5–2 $\mu$ thick; cells subequal or the upper ca. 10 $\mu$ long, lower 10–13·5 $\mu$ long.

On *Dichrostachys glomerata* (Forsk.) Chiov., Winkle Spruit, *Doidge*, 2513, Type; Verulam, *Pole Evans*, 6833.

In the original description, the name of the host was incorrectly given as *Dalbergia armata*; a branch of this plant was mixed with the material, but the fungus is on Dichrostachys.

## OPHIODOTHELLA v. Höhn.

**Ophiodothella edax** (B. et Br.) v. Höhn.

Fragm. Myk. 12 (1910) No. 630; Theiss. and Syd., Ann. Myc. 13 (1915) p. 613; Doidge, Bothalia I (1921) p. 32.

*Dothidea edax* B. et Br., Jour. Linn. Soc. (1873) p. 135.

*Ophiodothis edax* Sacc., Syll. Fung. II, p. 653.

Not on definite leaf spots, but causing rather extensive yellow discoloration of the leaf tissues. Stromata placed between the veins of the leaf in elongated groups up to 3 mm. long and 1 mm. broad; not infrequently an oval ring of younger stromata forms round an older group. Single stromata amphigenous, mostly epiphyllous, but visible also on the opposite side of the leaf, minute, punctiform, ca. 0·3 mm. diam., usually becoming confluent in groups.

Clypeus in the epidermis on both sides of the leaf, brownish black, opaque, often somewhat raised and bluntly conical over the apex of the perithecia, 20–30 $\mu$ thick in the upper epidermis, ca. 20 $\mu$ thick in the lower. Stroma in the mesophyll consists of rather loosely reticulate, branched, pale olive brown to hyaline hyphae 2·5–4 $\mu$ thick.

Perithecia 1-3 in each stroma, globose or flattened globose, deeply immersed, 150–250 $\mu$ diam., 150–200 $\mu$ high. Ostiole papilliform or truncate conical, completely immersed in the clypeus, periphysate. Perithecial wall subhyaline to light brown, 8–10 $\mu$ thick, concentric fibrose. Asci numerous, 8-spored, clavate-ellipsoid, pedicellate, 70-80 × 10–13 $\mu$. Spores parallel, filiform, continuous, hyaline, straight or curved, tapering somewhat to the blunt ends, 45–60 × 3–3·3 $\mu$. Paraphyses not seen.

On *Tephrosia elongata* E. Mey., on leaves, Olifantsfontein, *Pienaar*, 12822.

**Ophiodothella Liebenbergii** Doidge nov. spec.

Stromata epiphylla, maculis dilute brunneis circularibus usque irregularibus usque 1 cm. diam. metientibus insidentia, maculis saepe numerosis et confluentibus, tunc magnam folii partem occupantibus; stromata in maculis plus minus dense dispersa, discreta vel 2–3 dense aggregata, atra, convexa, nitida, usque 0·3 mm. diam.; clypeo epidermali atro-brunneo, opaco, 20–25 $\mu$ vel usque 40 $\mu$ crasso, ultra perithecia haud extenso; stromate in mesophyllo parce evoluto hyalino. Perithecia solitaria, subglobosa, vel irregularia, profunde immersa, 160–250 $\mu$ diam., 150–180 $\mu$ alta, ostiolo brevi, late conoideo clypeo omnino immerso, copiose periphysato, poro plus minus rotundato 15–20 $\mu$ lato pertuso praedita; pariete perithecii parum perspicuo, 5–7·5 $\mu$ crasso, concentrice fibroso, hyalino. Asci sat numerosi, 8-spori, ellipsoidei, antice rotundati, sessiles, recti v. leniter curvati, 65–75 × 10–15 $\mu$. Sporae parallelae, contortae, hyalinae, lineares, 50–62·5 $\mu$ longae, ad basim rotundatam vel truncatam 2·5–3 $\mu$ crassae, sursum sensim attenuatae, curvatae, continuae.

Hab. in foliis *Ochna pulchrae*, Hartebeestpoort, leg. Liebenberg, 30382.

On light brown leaf spots, which are circular to irregular in outline and up to 1 cm. diam., often numerous, becoming confluent and covering a large part of the leaf. Stromata epiphyllous, scattered on the leaf spots, discrete or in small, closely crowded groups of 2–3, black, convex, shining, minute, up to ca. 0·3 mm. diam.

Clypeus in the upper epidermis opaque, blackish brown, 20–25 $\mu$ thick, up to 40 $\mu$ thick over the apex of the perithecia, not extending beyond the perithecia, formed of closely interwoven, dark olive brown hyphae 2·5–4 $\mu$ thick. Stroma in the mesophyll composed of rather loosely reticulate hyaline hyphae.

Perithecia solitary, subglobose or somewhat irregular in form, deeply immersed in the mesophyll, 160–250 $\mu$ diam., 150–180 $\mu$ high; ostiole flat, truncate conical, immersed in the clypeus, periphysate, with a more or less round pore 15–20 $\mu$ broad. Perithecial wall delicate, hyaline, 5–7·5 $\mu$ thick, concentric fibrose, closely appressed to the cells of the host. Asci fairly numerous, 8-spored, ellipsoid, rounded at the apex, sessile, straight or somewhat curved, 65–75 × 10–15 $\mu$. Spores parallel, twisted, hyaline, continuous, linear, 50–62·5 $\mu$ long, 2·5–3 $\mu$ broad at the rounded or truncate base and tapering gradually to the apex, curved, usually more or less sinuous. Paraphyses sparse.

On *Ochna pulchra* Hook., on leaves, Hartebeespoort below the dam, *Liebenbery*, 30382, Type; The Willows, Pretoria District, *Doidge and Bottomley*, 29735; Meintjes Kop, Pretoria, *Hean*, 32801; The Kloof, Rustenburg, *Hean*, 31084.

**DIACHORA** J. Mull. emend. Petrak.

Ann. Myc. 22 (1924) p. 130.

Leaf parasites. Stroma extensive, delicate, permeating all the leaf tissues and defined on either side by a parenchymatous "rind" in the epidermis; within, the stroma is sclerotial, hyaline or subhyaline. Perithecia completely and permanently immersed in the stroma, rather remote from one another, only the ostiole erumpent; ostiole papilliform or truncate-conical. Perithecial wall more or less parallel-fibrose, rather light coloured, weakly membranous, almost fleshy. Asci very delicate, cylindrical, sessile or briefly pedicellate, 8-spored. Spores ellipsoid or ovate, 1-celled, hyaline, of medium size.

Petrak (l.c.) states that the genus Diachora, of which the species are found on Leguminosae, is intermediate between Physalosporina and Phyllachora, and that it affords an indication that the true Phyllachora spp. must have developed from Physalosporina-like forms. The position of the genus is ambiguous, but it is included here with the Phyllachoraceae.

**Diachora Lessertiae** (Doidge) Petr.

Ann. Myc. 32 (1934) p. 349.

*Phyllachora Lessertiae* Doidge, Bothalia I (1921) p. 30.

Stroma extensive, usually penetrating right through the leaf, which becomes distended to a thickness of 300–700 $\mu$; it also develops on the petioles and stems, encircling them and spreading more or less extensively. The leaf tissues are discoloured light brown; greyish black or brownish black spots develop round the ostioles of the perithecia, and these often coalesce so that the greater part of the leaf surface appears black.

Ground tissue of the stroma sclerotial, plectenchymatous, consisting of thick-walled hyphae 4–6 $\mu$ thick, irregularly and very freely branched and interwoven. Over the perithecia and in their vicinity the stroma tissue is coloured more or less dark olive brown.

Perithecia scattered irregularly, but seldom single, usually in closely crowded groups of 2–4 and more or less coalescent, sometimes quite fused, rather deeply immersed, globose, broadly ellipsoid or ovate, often flattened laterally through mutual pressure and irregular, ca. 160–230 $\mu$ diam., narrowing above into a thick, truncate conical ostiole, which is pseudoparenchymatous, with an irregularly round pore. Perithecial wall weakly membranous to fleshy, ca. 15–25 $\mu$ thick, consisting of numerous layers of closely compressed cells, hyaline or pale at the base and sides, with cells ca. 8–16 $\mu$ diam., pellucid olive brown near the apex and formed of smaller dark brown cells, usually not sharply defined externally and merging with the stroma tissue. Asci numerous, cylindrical to subclavate, broadly rounded above, narrowed below into a short stalk, 8-spored, thin-walled, sp. part. 70–90 × 12–14 $\mu$. Spores monostichous or incompletely distichous, ellipsoid or ovate, broadly rounded at both ends, continuous, hyaline, 10–15 × 5–6·5 $\mu$. Paraphyses rather sparse, broadly filamentous, very thin-walled, ca. 3–4 $\mu$ thick.

On *Lessertia depressa* Harv., on leaves and stems, Smitskraal, *Burtt Davy*, 1568, Type. *Lessertia perennans* D.C., Mooi River, Natal, Mogg, 17038.

*Lessertia stricta* Bolus, Nottingham Road, *McClean*, 32285.

The host of the type collection was wrongly named; it is *Lessertia depressa* not *L. tenuifolia*.

## SPECIES EXCLUDENDAE VEL DUBIAE.

A number of South African fungi previously included in the Phyllachoraceae have not been described in this paper and the reasons for their exclusion are set forth in the following notes.

**Coccochora Lebeckiae** Verw. et Dipp.

S. Afric. Jour. Sci. 27 (1930) p. 328.

On *Lebeckia Cavalleriana*, Stellenbosch, *van der Byl 389* and Gordon's Bay, *Loeby* (*van der Byl 2590*).

This fungus, which is described accurately and in detail by Verwoerd and Dippenaar (l.c.) is an Aphysa and may be called *Aphysia Lebeckiae* (Verw. et Dipp.) Doidge.

**Dictyochorella Andropogonis** Doidge.

Bothalia I (1922) p. 66.

The muriform spores described belong to *Phaeopeltosphaeria Doidgeae* Petr. (Ann. Myc. 25, 1927, pp. 293–295) which is parasitic in a phyllachoraceous stroma. The host is probably *Phyllachora Doidgeae* Syd. on Cymbopogon sp. See also Bothalia IV (1941) p. 212.

**Oligostroma maculiformis** (Wint.) Doidge.

Bothalia I (1921) p. 41.

*Didymella maculiformis* Wint., Hedwigia 23 (1884) p. 169; Rabh. Wint. Fung. Eur. 3050.

*Oligostroma Proteae* Syd., Ann. Myc. 12 (1914) p. 265 and 13 (1915) p. 592; Petrak, Ann. Myc. 22 (1924) p. 116.

On *Protea grandiflora* Thunb., near Cape Town, *MacOwan*, 3396 (Rabh. Fung. Eur. 3050).

*Protea Humboldtii* Phil., Kentani, Pegler, 5163, 5618, type collection of *O. Proteae*.

This fungus is common throughout South Africa on *Protea* spp. The genus is excluded from the Phyllachoraceae by Petrak (l.c.). He disagrees with v. Höhnel's view (Ber. Deutsch. bot. Ges. XXXV, 1917, p. 629) that Oligostroma is closely related to Endodothella and states that it stands in close relationship to Didymella and Mycosphaerella and is a genus of the true Dothideales in the broad sense, the Phyllachoraceae being now regarded as belonging to the Sphaeriales.

**Phaeodothis stenostoma** (Ell. et Tr.) Th. et Syd.

Ann. Myc. 13 (1915) p. 596; Doidge, Bothalia I (1922) p. 66.

On *Panicum maximum* Jacq., Bluff, Durban, *Doidge*, 1611.

The type specimen of this fungus has not been seen, but the South African specimens identified as *Phaeodothis stenostoma* (Doidge l.c.) are *Cryptodidymosphaeria clandestina* Syd., which is parasitic in the stroma of *Phyllachora heterospora*. See also Bothalia IV (1941) p. 206.

**Phaeodothis Tristachyae** Syd.

Ann. Myc. 10 (1912) p. 11; Theissen and Sydow, Ann. Myc. 13 (1915) p. 595; Doidge, Bothalia I (1922) p. 67.

On *Tristachya hispida* Schum., on leaves, Mooi River, Natal, *Burtt Davy*, 1470.

This is also *Cryptodiaporthe chaetostoma*. The Phyllachora on Tristachya on which it is parasitic has not been found in good condition and is undetermined.

**Phyllachora Kniphofiae** (Kalchbr. et Cke.) Sacc.

Syll. Fung. II (1883) p. 607

*Dothidea Kniphofiae* K. et Cke., Grevillea IX (1882) p. 31

On dying leaves of *Kniphofia* [illegible] Natal, Buchanan, Mrs. [illegible] (Kalchbr. Cke. Fung. Eur. 3556).

According to Theissen and Sydow (Ann. Myc. 13, 1915, p. 508) this is not a Phyllachora. The original specimen has Sphaerella-like perithecia without a true clypeus.

**Telimena corticicola** Doidge.

Bothalia I (1923) p. 70.

On stems of *Helichrysum* sp., Alice, *Doidge*, 10078.

As defined by Petrak, the fungi of the genus Telimena are exclusively leaf parasites and the type-species of the genus belongs to the Diaporthaceae group. The fungus therefore excluded and cannot be a Telimena. Material is unfortunately very scanty and further collections will be necessary before a critical study can be made.

**Thyriopsis Proteae** van der Byl.

S. Afric. Jour. Sci. 26 (1929) p. 318.

On leaves of *Protea scabra*, Caledon District, *van der Byl* 2511.

The type-specimen quoted above does not differ from *Lembosia* [illegible] Doidge Bothalia IV (1941) p. 188.

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# THE GENUS *ERIOMYCOPSIS* SPEG.

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The present paper is the outcome of a long study of the hyper-parasites of the leaf fungi of Uganda, extended recently to collections received from F. L. Hendrickx, Congo Belge; Dr. Bitancourt, Sao Paulo, Brazil; and from Dr. E. M. Doidge, Pretoria. Members of the present genus are some of the most common hyper-parasites of *Meliola*, *Asterina* and other leaf fungi, and appear to occur throughout the range of their hosts. One of the greatest difficulties in dealing with these hyper-parasites is to obtain material sufficiently uniform for preservation as herbarium specimens, and the experience of the writer has led him to take as the unit specimen the actual single colony of the host fungus examined, and even here there may be more than one species of *Eriomycopsis* occurring in mixed infection. On a single leaf a number of colonies of *Meliola* or *Asterina* or both may be found, and these may show a wide range of hyper-parasites, not only of this present genus but of others totally unrelated. In view of this difficulty a series of microscopical preparations have been made by the writer and deposited in the Herbarium of the Imperial Mycological Institute, Kew, to serve as examples of the various species described below.

The genus *Eriomycopsis* was founded by Spegazzini in 1910 (An. Mus. Nac. Buenos Aires, xx, p. 429) on the species *E. Bomplandi*, parasitic on *Meliola*. Sydow in Ann. Myc., xxvii, p. 137 (1929) described a second species *E. tenuis*, parasitic on *Parodiopsis Stevensii*, differing considerably from *E. Bomplandi*. These two species are all the writer has been able to trace as published hitherto, but in the collections examined by him a series of forms have been found, obviously related to the two species mentioned above, but exhibiting a considerable range in structure and conidial formation. These are described below, and in order to include them in *Eriomycopsis*, the original generic diagnosis must be modified. The conidia are in most species formed on short sterigmata, either hollow or apparently solid, at first terminal on the conidiophore, but becoming lateral by the growth of the latter past the sterigma; in *E. Sclerochitionis* the conidiophore grows *through* the conidial scar so that this remains as a broken ring around the wall of the conidiophore. In some species the sterigmata are not evident and the conidia leave merely a flat scar on the conidiophore, while in others the sterigma adheres to the conidium when this matures and falls off, instead of to the wall of the conidiophore. In a few species the mycelium and sometimes the conidiophores become distinctly smoky in colour.

**ERIOMYCOPSIS** Speg., emend.

Hyphomycetea mucedinea, macronemea, in fungis aliis hyperparasitica: conidiophora erecta simplicia continua vel septata; conidia in sterigmatis minutis producta, ngula, acro-pleurogenea fusoidea vel filiformia, 1-multi-septata, hyalina, majuscula levia.

KEY TO SPECIES.

Conidia more or less filiform.
- Conidia hamate, 1-septate, —30 × 2·5 μ..... *hamata* (1).
- Conidia not hamate.
  - Condiophores hardly differentiated, conidia 0–3-septate, —35 × 3 μ..... *minima* (2).
  - Conidiophores apparent, elongate, erect.
    - Conidia 3-sept., —70 × 3·5 μ with long attenuate apex; colour developed in old colonies..... *flagellata* (3).
    - Conidia 3–5-sept., 70–100 × 2·5–3·5 μ, always hyaline..... *angustispora* (4).

Conidia narrow (—7 μ) but not filiform.
- Sterigmata rudimentary or none.
  - Conidial scars lateral.
    - Conidia 2–5-sept., —70 × 5 μ..... *africana* (5).
    - Conidia 5–10-sept., —60 × 6 μ..... *Asterinae* (6).
    - Mycelium and conidiophores yellowish, conidia 3-sept., with apical beak, —45 × 5–7 μ..... *Bosquieae* (7).
  - Conidial scars broken rings on c'phore, conidia 3–7-sept., slightly hamate, —90 × 5–7 μ..... *Sclerochitonis* (8).

Sterigmata lateral on conidiophore.
Conidia clavate, rounded at apex, 3-sept., 20–37 × 5–8 μ..... *Schiffnerulae* (9).
Conidia fusoid, with basal sterigma.
Mycelium becoming smoky, conidia 3-sept., —50 × 7 μ..... *Ugandae* (10).
Mycelium remaining hyaline.
Condia 3-sept., acute at apex, 16–45 × 5·5–8 μ..... *tenuis* (11).
Conidia 3-sept., apex long attenuate, 30–70 × 5–6 μ..... *Trichiliae* (12).
Conidia more than 7 μ wide.
Sterigmata present.
Conidia fusoid, 3–5-sept., 45–90 × 7–10 μ..... *Bomplandi* (13).
Conidia with attenuate apex, sterigmata reduced to flat scars 3 × 1 μ, conidia 3–7-sept., 50–100 × 6–9 μ..... *robusta* (14).
Sterigmata absent.
Conidia 3–6-sept., 50–80 × 7–9 μ, apex attenuate-rounded..... *Chorleyi* (15).
Conidia 4-sept., 70–80 × 11–12 μ, apex flagellate, base conoid-truncate... *Meliolae* (16).

1. **E. hamata** Hansf., sp. n.

Plagulae albae tenues vel densae. Mycelium ex hyphis hyalinis agglutinis 2–3 μ crassis indistincte septatis ramosissimis compositum. Conidiophora erecta 0–1-septata simplicia hyalina sursum attenuata et geniculata, usque ad 50 μ longa. Sterigmata minuta solida. Conidia hamata hyalina 1-septata haud constricta, versus basim truncatulum attenuata, apice flagellata curvata, 25–30 × 2–2·5 μ.

Hab. in plagulis *Meliolae* spec., Rifle Range, Kiagwe, *Hansford 2676 p.p.*

The fungus forms white colonies varying much in density and completely covering the colony of the host. The conidiophores arise as lateral branches from the mycelial hyphae and at the basal septum they bend through a right angle to become vertical. Conidia similar to those of this species are occasionally found in colonies of other species of this genus, and further investigation is needed to determine whether in such cases *E. hamata* occurs in mixed infection, or whether other species in young stages form conidia of this type. *E. hamata* is often associated with a common Discomycete parasite of *Meliola* and may be its conidial stage.

2. **E. minima** Hansf., sp. n.

Plagulae albae vel dilute roseae tenues; mycelium ex hyphis repentibus hyalinis reticulatis indistincte septatis 3 μ crassis compositum. Conidiophora erecta 30–50 μ longa simplicia hyalina 0–3-septata recta vel geniculata, circa 4 μ crassa. Conidia singula fusoidea hyalina utrinque acuta 0–3-septata haud constricta 20–35 × 2–3 μ.

Hab. in plagulis *Ireninae glabrae*, Kampala, Uganda, *Hansford 1871 p.p.*

Other Uganda collections (*Hansford*) are *2859*, on *Balladyna tenue*, *2861* on *Balladyna magnifica*, *2869* on *Meliola Rhois*, *2984* on *Irenopsis Macarangae*. In S. Africa the following have been determined as this species (the collection numbers are those of Herb. Myc., Pretoria): *1402* on *Meliola capensis*, *11020* on *M. comata*, *32229* on *Meliola ganglifera*, *1781* on *Irene Strophanthi*, *17166* on *I. Podocarpi*, *17107* on *I. Nuxiae*.

In this species the conidiophores are usually mere erect ends or short branches of the mycelial hyphae, with a few scattered minute granules or warts, less than 1 μ high, on the surface of the end cell, possibly representing rudimentary sterigmata. The conidia are slightly bent, acute at both ends, with little distinction between base and apex, very indistinctly 3-septate or merely guttulate.

3. **E. flagellata** Hansf., sp. n.

Plagulae tenues albidae vel sordidae: mycelium ex hyphis hyalinis vel dilute fuligineis repentis septatis ramosissimis subagglutinis 2–4 μ crassis compositum. Conidiophora singula vel fasciculata erecta simplicia vel rarius furcata hyalina vel inferne dilutissime fuliginea, usque ad 200 μ longa, 3·5–4·5 μ cr.: pluriseptata, superne geniculata et sterigmatis praedita; sterigmata 1 μ longa. Conidia singula terminalia filiformia hyalina utrinque attenuata, basi truncatula, apice curvula flagellata, 3-septata, 40–70 × 2–3·5 μ.

Hab. in plagulis *Ireninae* spec., Gayaza Road, Uganda, *Hansford 2635.*

Other collections of this species are: (Uganda, *Hansford*) *2571*, *2684* on *Irenina* and *Asterina* on *Trema*, *2710* on *Irenina Hansfordii*, *2843* on *Meliola borneensis*, *2881* on *Meliola Artabotrydis*, *2696* on *Schiffnerula mirabilis*; *Arruda 2981* on *Irenopsis tortuosa*, Brazil.

In old colonies the mycelium and base of the conidiophores turn smoky brown; the conidia are terminal, each leaving a minute solid sterigma about 1 μ long on the conidiophore; the latter continues its growth so that the old sterigmata become lateral and the axis is more or less geniculate at each. The conidia are narrow filiform with a bent whip-like apex, attenuate and truncate at the basal hilum.

4. **E. angustispora** Hansf., sp. n.

Plagulae tenues albidae ; mycelium ex hyphis hyalinis repentis indistincte septatis ramosissimis 2 $\mu$ cr. compositum. Conidiophora lateralia erecta continua simplicia hyalina usque ad 40 $\mu$ longa, 3–4 $\mu$ cr., superne leniter attenuata ; sterigmata nulla. Conidia terminalia filiformia curvula 3–5-septata hyalina haud constricta basi truncata apice attenuato-rotundata, 70–100 × 2·5–3·5 $\mu$.

Hab. in plagulis *Hysterostomellae Tetracerae*, Entebbe Road, Uganda, *Hansford 2796*. This differs from *E. flagellata* in its short hyaline conidiophores ; in the type specimen it is associated with a species of *Calonectria*.

5. **E. africana** Hansf., sp. n.

Plagulae tenuissimes albidae ; mycelium ex hyphis hyalinis agglutineo-reticulatis 1·5–2 $\mu$ crassis compositum. Conidiophora erecta simplicia hyalina usque ad 55 $\mu$ longa, basi 3·5–4 $\mu$ cr., 0–1-septata superne leniter geniculata. Sterigmata nulla. Conidia terminalia singula elongato-fusoidea curvula utrinque attenuata basi truncata, apice acuta, 2–5-septata haud constricta 40–70 × 3·5–5 $\mu$.

Hab. in plagulis *Asterinae* in foliis *Justiciae* spec., Hoima Road, Uganda, *Hansford 2671*.

The colonies are very thin and hardly visible, white. The conidiophores are erect branches of the mycelial hyphae, each arising from a swollen " foot cell " and are slightly attenuate upwards, usually 1-septate just above the base. The conidia are formed singly at the end of the conidiophore and leave no sterigma but merely a flat scar at which there is slight geniculation of the conidiophore after its elongation. Very young conidia somewhat resemble those of *E. hamata*.

6. **E. Asterinae** Hansf., sp. n.

Plagulae effusae tenues albidae ; mycelium ex hyphis hyalinis 3 $\mu$ cr. ramosissimis subagglutinis compositum. Conidiophora numerosa erecta simplicia usque ad 80 $\mu$ longa, 3–4 $\mu$ cr., 0–2-septata superne geniculata. Conidia singula terminalia elongato-fusoidea hyalina utrinque rotundata basi truncata apice subacuta vel rotundata 5–10-septata haud constricta 30–60 × 4–6 $\mu$.

Hab. in plagulis *Asterinae diplocarpae*, Entebbe Road, Uganda, *Hansford 2514*.

Other collections : Uganda, *Hansford : 2778, 2790* on *Asterina*, *2905* on *Asterinella* sp. on *Loranthus*, *2967* on *Asterina* ; S. Africa, *Doidge 17176* on *Asterina*.

The colonies are very thin and somewhat powdery, white, extending beyond those of the host. The conidia leave no sterigmata on the conidiophore, which is slightly geniculate at the flat scars. The base of the conidium is often slightly apiculate, ending in a truncate hilum and the septation is higher than in other species, with much shorter cells.

7. **E. Bosquieae** Hansf., sp. n.

Plagulae velutinae flavidae ; mycelium ex hyphis flavidis vel flavo-brunneis septatis 4 $\mu$ cr. ramosis reticulatis compositum. Conidiophora fasciculata erecta simplicia vel irregulariter furcata, deorsum flavida, sursum hyalina. usque ad 140 $\mu$ longa, 4 $\mu$ cr. ; sterigmata nulla. Conidia terminalia singula, primo obovata demum obclavata apice attenuato-hamata hyalina vel dilutissime flavida 3-septata usque ad 45 $\mu$ longa, 5–7 $\mu$ cr., apice 1–2 $\mu$ cr., basi attenuato-truncata.

Hab. in *Meliola Soroceae* in foliis *Bosquieae Phoberos*, Entebbe Road, Uganda, *Hansford 2913*.

This differs from other species in its pronounced yellow colour ; the conidia are very like those of *Arthrosporium parasiticum* Wint., but in the present collections there is no sign of a Stilbaceous aggregation of the conidiophores. The fungus has been collected repeatedly in Uganda, always on the same host.

8. **E. Sclerochitonis** Hansf., sp. n.

Plagulae tenues albidae ; mycelium ex hyphis hyalinis septatis ramosissimis subagglutinis repentis compositum. Conidiophora sparsa vel laxe aggregata erecta simplicia vel apice furcata hyalina septata circa 100 $\mu$ longa et 4–6 $\mu$ cr., basi sub-bulbosa (–9 $\mu$) superne leniter attenuata (3–4 $\mu$). Conidia singula terminalia hyalina curvula fusoidea, plerumque 5-septata haud constricta apice attenuato-acuta curvulaque, basi subtruncata, 50–90 × 5·5–7 $\mu$.

Hab. in plagulis *Meliolae Sclerochitonis*, Masaka Road, Uganda, *Hansford 2003 p.p.*

Other collections : Uganda, *Hansford : 2968* on *Meliola*. *1199a* on *Meliola*.

The method of conidial formation distinguishes this species from all others; each conidium leaves a flat, slightly hollow scar, though which the conoidiophore continues its apical growth. The conidia are somewhat attenuate-beaked and bent at the apex; they germinate by extension of the apex into a hypha and by a thin hypha produced through the truncate base.

9. **E. Schiffnerulae** Hansf., sp. n.

Plagulae albidae effusae plus minusve velutinae; mycelium ex hyphis hyalinis 2–3·5 $\mu$ cr. ramosissimis subagglutinis septatis compositum. Conidiophora aggregata vel dispersa usque ad 300 $\mu$ longa 3–4·5 $\mu$ cr. septata plerumque simplicia superne geniculata sterigmatibus praedita. Conidia clavata basi attenuata apice late rotundata, recta 3-septata haud constricta 20–37 × 5–8 $\mu$.

Hab. in plagulis *Schiffnerulae mirabilis* in foliis *Passiflorae*, Entebbe Road, Uganda, *Hansford 1819*.

Other collections: Uganda, *Hansford*: *1846*, *1841*, *1821*, *2641*, *2825*, on *Schiffnerula* spp.; *2325*, *2342* on *Balladyna* spp.; *2664* on *Meliola*.

This differs from *E. tenuis* in the rounded apices of the conidia; the sterigmata are widely separated along the conidiophore and are up to 4 $\mu$ long by 1 $\mu$ wide, hollow cylindric with a septum at the base; by continued growth of the condiophore they are left as lateral spines.

10. **E. Ugandae** Hansf. sp. n.

Plagulae albidae vel sordidae tenues; mycelium ex hyphis hyalinis vel dilute fuligineis ramosis reticulatis septatis 3–4·5 $\mu$ cr. compositum. Conidiophora dispersa vel laxe aggregata erecta simplicia hyalina vel inferne dilute fuliginea, usque ad 300 $\mu$ longa, 4–6 $\mu$ crassa, simplicia, superne geniculata. Conidia singula terminalia hyalina fusoidea utrinque attenuata apice subacuta, basi truncato-apiculata, 3-septata haud constricta 30–50 × 5–7 $\mu$. Sterigmata numerosa cylindracea usque ad 5 $\mu$ longa et 1–1·5 $\mu$ cr.

Hab. in plagulis *Schiffnerulae Brideliae* in foliis *Brideliae*, Kampala, Uganda, *Hansford 1331 p.p.*

Other collections Uganda, *Hansford*: *2678*, *2641*, *2634*, *2959* on *Schiffnerula* spp.; S. Africa, *Doidge 12298* on *Irene scabra*.

The sterigmata in *M. Ugandae* are rather larger and more numerous than in *E. Schiffnerulae*, from which it differs in shape and size of conidia and in the production of colour in older colonies. The sterigmata are hollow cylindric with a basal septum.

11. **E. tenuis** Syd. in Ann. Myc., xxvii, p. 137 (1929).

Colonies white, loose to dense, or thin arachnoid, often subfloccose, effuse. Mycelium of loose branched hyphae, creeping, hyaline, remotely and indistinctly septate, 4–6 $\mu$ wide. Conidiophores erect, straight or slightly curved, rarely undulate, 4–5 $\mu$ wide, remotely and indistinctly septate, 100–170 $\mu$ long, hyaline, with 3–6 minute papillae towards the tip. Conidia solitary on papillae, oblong-clavate to almost oblong-fusoid, rarely oblong ellipsoid, widest in upper part, rounded to acute at the apex, when mature 3-septate, 25–45 × 5·5–8 $\mu$.

On *Parodiopsis Stevensii* on *Inga marginata*, Porto Rico, Sydow, Fung. exot, exs., No. 704.

Sydow's original description gives the conidia as wide rounded at the apex, but examination of this specimen shows by far the greater number of conidia to have definitely acute apices, and it is considered that those with rounded apices are immature. No other collection of this fungus has been found by the present writer.

12. **E. Trichiliae** Hansf., sp. n.

Plagulae albidae tenues; mycelium ex hyphis hyalinis repentis septatis ramosissimis reticulatis subagglutinatis 2·5–3·5 $\mu$ cr. compositum. Conidiophora erecta subrecta hyalina septata simplicia 40–150 × 3–6 $\mu$, sursum leniter attenuata; sterigmata 1–2 $\mu$ longa. Conidia singula terminalia hyalina fusoidea, apice attenuata vel caudata, basi attenuato-apiculata, recta vel curvula, 3-septata 30–70 × 4·5–6 $\mu$.

Hab. in plagulis *Asterinae* spec., foliis *Trichiliae*, Entebbe Road, Uganda, *Hansford 2517*.

Also *Hansford 2833*, *2829* on Microthyriaceae on *Teclea*, Kiterera, Busoga, Uganda.

The conidia differ from *E. Schiffnerulae* and *E. tenuis* in the attenuate to beaked apex; at the base they retain the greater part of the cylindric, straight or bent, solid sterigma.

13. **E. Bomplandi** Speg. in Myc. Argent., v, No. 429 in Anal. Mus. Nac. Buenos Aires, xx (1910).

Spegazzini's original description gives: Colonies white, velvety, on *Meliola*. Conidiophores erect 5–6-septate, 180–200 × 7–8 μ, top cell colliculose-papillate and bearing conidia, 40–50 × 9–10 μ. Conidia borne on sterigmata on terminal cell of conidiophore, 50–70 × 10–11 μ, usually 3-septate, ends acute, slightly arcuate, not or slightly constricted.

In Herb. Kew there is no specimen of *E. Bomplandi*, but *Balansa 4744* and *Roum 4141.* (leg. *Balansa*), sub. *Calonectria melioloides* Speg. both show an *Eriomycopsis* corresponding rather closely to the above description, as well as a species of *Calonectria* with setose perithecia and therefore not *C. melioloides* Speg., which is described as glabrous. In these specimens the *Eriomycopsis* has the following characters :—

Conidiophores erect from an agglutinate plate of hyaline hyphae, fasciculate or scattered, 200–400 × 6–7 μ, swollen at the base to 8–10 μ wide, hyaline, rather thick-walled, with 5–10 cross septa, simple. The uppermost cell, rarely also the next below, has numerous hollow cylindric sterigmata 3 μ wide and 2 μ long, on the surface. The conidia are fusoid slightly bent, attenuate at the ends, slightly narrower at the rounded apex than at the subtruncate base, mostly 3-septate but sometimes with a more or less indistinct fourth septum towards the apex, smooth, thin-walled, hyaline, not usually constricted, 45–70 × 7–10 μ.

*Hansford 2684* on *Irenina Tremae* has conidia rather narrower and more bent at the apex than these Brazilian specimens, but is considered to be *E. Bomplandi*. *Deighton CB 825* on *Meliola* on *Millettia*, Gold Coast, has conidia 50–90 × 8–10 μ, mostly 4-septate; the sterigmata are rather longer and narrower than in typical *E. Bomplandi*, though here it is included in this species. Other collections examined by the writer and included here are: Uganda, *Hansford* : *2490* on *Irene* on *Oncoba*, with the perithecial stage (*Calonectria Ugandae* Hansf.), *2640* on *Meliola Maitlandii*, *2791* on *Asterina Tremae*, *2835* on *Meliola* on *Albizzia* (with *C. Ugandae*); Congo Belge, *Hendrickx*: *858* on *Irenopsis Caloncobae* (with *C. Ugandae*), *1062* on *Meliola bicornis* var.; S. Africa, *Doidge*: *17772* on *Irene natalensis* [with unripe *C. Ugandae* (?)], *11611* on *Irene scabra*, *11338* on *I. scabra* (with *C. Ugandae*), *12298* on *I. scabra* (do.), *17181* on *I. Nuxiae*, 32234 on I. atra, *22410* on *Meliola* on *Olea*, *32122* on *Meliola Goniomae*, *32229* p.p. on *M. ganglifera*, *10933* on *M. ganglifera*.

14. **E. robusta** Hansf., sp. n.

Plagulae albidae tenues; mycelium ex hyphis hyalinis subagglutinis septatis 3 μ cr. compositum. Conidiophora erecta dispersa vel fasciculata hyalina septata simplicia rarius furcata rigida superne geniculata, 150–300 × 7–9 μ. Conidia singula terminalia fusoidea hyalina utrinque attenuata, basi truncata, apice longe attenuata, 3–7-septata haud constricta 50–100 × 6–8 μ.

Hab. in plagulis *Meliolae*, *Hansford 2667*, Hoima Road, Uganda.

The conidiophores are very rigid and thick-walled; sterigmata short and wide (1 × 3–4 μ) on the upper two cells of the conidiophore as raised thickened portions of the wall. The conidia have rather a wide truncate base (3–4 μ) and the apex is drawn out into a narrow curved beak; septation averages higher than in *E. Bomplandi*.

15. **E. Chorleyi** Hansf., sp. n.

Plagulae albidae tenues; mycelium ex hyphis hyalinis reticulatis ramosissimis remote septatis 3 μ cr. compositum. Conidiophora erecta solitaria vel fasciculata septata hyalina simplicia superne nodulosa 100–180 × 5–6 μ. Conidia terminalia singula fusoideo-falcata hyalina 3–6-septata haud constricta, apice attenuata rotundata, basi truncata, 50–80 × 7–9 μ.

Hab. in plagulis *Meliolae Chorleyi* in foliis *Trichiliae*, Entebbi Road, *Hansford 2357*, *2585*.

No sterigmata are present in this species and the conidia leave a flat scar on the conidia which is rarely geniculate.

16. **E. Meliolae** Hansf., sp. n.

Mycelium tenuum album, ex hyphis reticulatis 4–6 μ cr. septatis remosissimis compositum. Conidiophora fasciculata (–20) erecta hyalina recta vel subrecta simplicia septata 280–400 × 6–9 μ, superne nodulosa. Conidia acrogenea singula hyalina fusoidea curvula 3–4-septata leniter constricta, basi conoideo-truncata, apice attenuata in appendicem filiformam producta (–40 × 1·5–2 μ), conidia tota 65–90 × 11–12 μ.

Hab. in plagulis *Meliolae Tecleae* in foliis *Tecleae*, Kazi, Kampala, *Hansford 1909* p.p.

Other collections (Uganda, *Hansford*) : *2834* on *M. Tecleae*, *2866* on *M. Tecleae*, *1539*, *2608*, *2874* on *Meliola* spp. on *Rhus glaucescens*. In all these specimens, as in the type, the fungus is accompanied by the perithecial stage, *Calonectria Meliolae* Hansf.

No sterigmata occur, the conidia leaving only a flattened scar on the conidiophore at which the latter is geniculate-nodulose.

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Apart from the perithecial stages assigned above to certain species of *Eriomycopsis*, other cases of association have been recorded but are not yet sufficiently definite. Attempts have been made to cultivate *Eriomycopsis* on artificial media but have not been successful, while from many perithecial forms associated with *Eriomycopsis* only *Cephalosporium* conidia have been produced in culture.

The writer is indebted to Mr. E. W. Mason of the Imperial Mycological Institute for pointing out the difference between *E. tenuis* and its near relatives.

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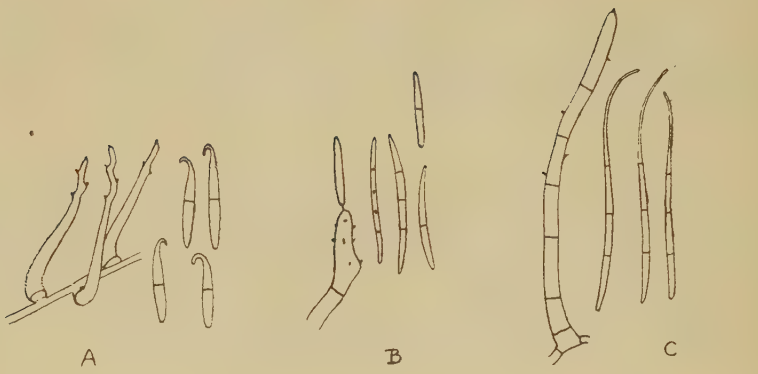
FIGURES. All × 1,000.

In each illustration the conidiophores or their ends are given on the left, the conidia on the right.

A. *E. hamata.*
B. *E. minima.*
C. *E. flagellata.*
D. *E. africana.*
E. *E. Asterinae.*
F. Omitted.
G. *E. Sclerochitonis.*
H. *E. Schiffnerulae.*
J. *E. Ugandae.*
K. *E. Trichiliae.*
L. *E. Bomplandi.*
M. *E. Bomplandi* (ex *Deighton CB* 825).
N. *E. robusta.*
O. *E. Chorleyi.*
P. *E. Meliolae.*
Q. *E. angustispora.*
R. *E. tenuis.*
S. *E. Trichiliae*, showing variation from K.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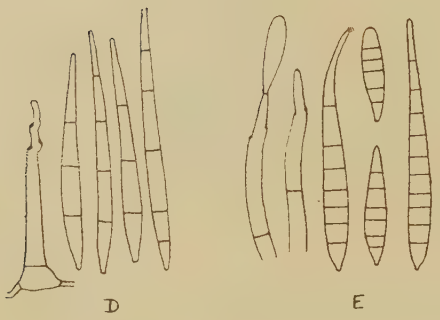
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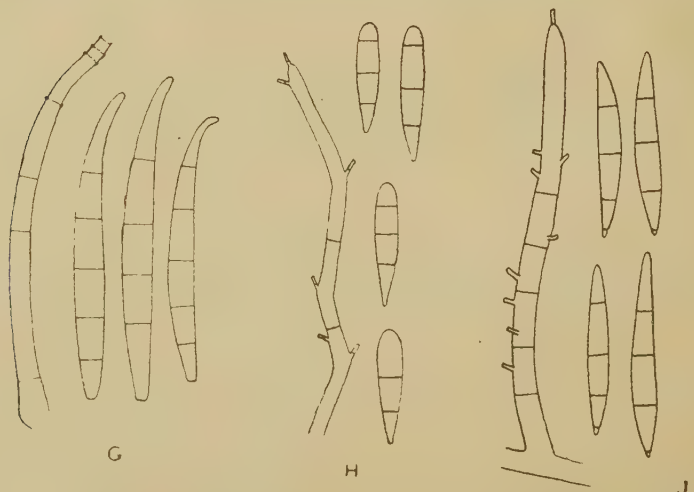
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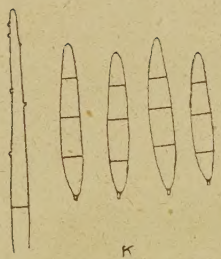
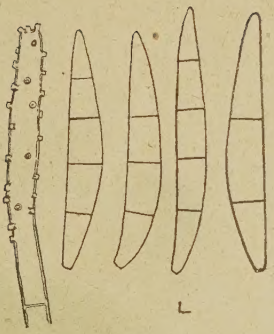


K



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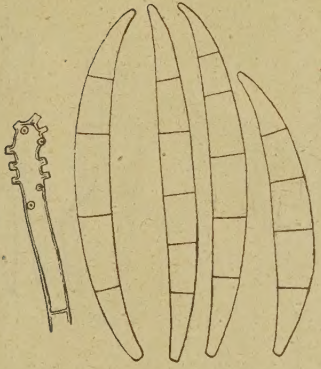

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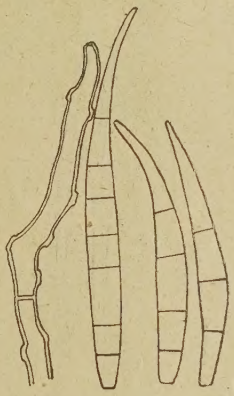

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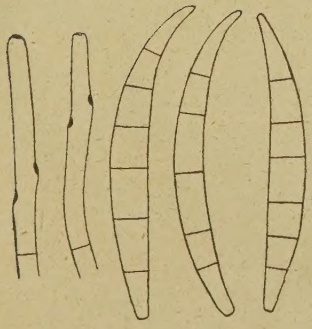

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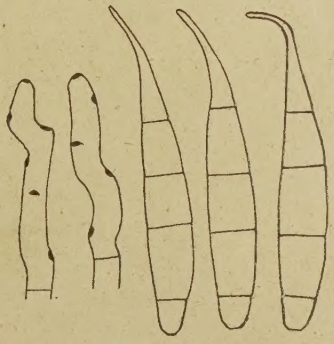

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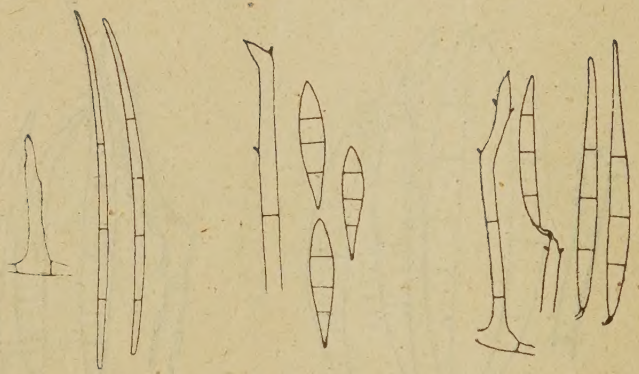

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